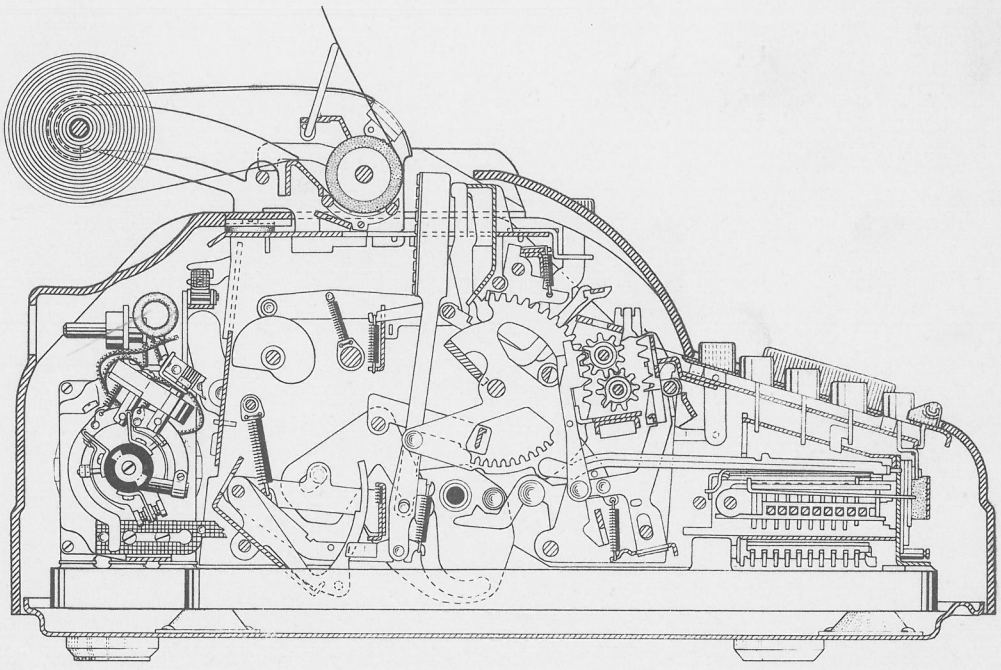
Addo

SERVICE MANUAL

Addo-X SERIE 40



Addo

S E R V I C E M A N U A L A D D O - X

40 SERIES

There is a heavy demand for technical instructions regarding the machines of the indicated series. To meet the requests we have decided to distribute the manual by sections as they are ready from our printing-office. This course is not a good one, and it is taken only because of appeals from many service shops.

The first pages of this manual, which are sent at the same time as this circular letter, could preferably be collected under the same cover as "Service Manual Addo-X", and we beg to underline the old rule: If pages are re-printed and sent out to the field, it means that the corresponding old pages are cancalled and should be taken out of the cover.

Anton Sernbo

Anton Sernbo
Service Manager

3.22.51

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THE COVER

The cover used on hand model machines of the 40-series has the number 40-1001, or [electrical machines] 40-1001E. It is made of a magnesium alloy. If the cover is wrinkle-finished in green colour, an affix is added to the base number, namely F50 [F for finish; 50 for green wrinkle-]. The affix is F60 for grey wrinkel-finish.

In order to subdue the noise the machine may make, the cover is lined on the inside. When ordering, note, for example: 1 set of cover-lining, mod. 341E etc.

Removal

Take off the Ribbon Spool Covers 40K517V/H and loosen the two Screws 1004, which attach the carriage to the machine. Then you can remove the carriage, and after unscrewing the four Screws 1001S [on grey machines 1001S-fn] that keep it to the rubber base or the bottom cover, also the cover is free to be lifted off the machine.

Rubber Base

The hand model machine is mounted on a rubber base which is cast integral with the fixing brackets and rubber feet. The base is attached to the machine by means of two Screws 1025 with Washers 1006.

Bottom Cover

The electrical machine is mounted on a Bottom Cover nr. 40K1074E over four Dampers 40K1075E, which are riveted to the cover and attached to the machine with screws. The rear feet, 40K1009E, are provided with rings of felt, which facilitate sliding the machine across a desk. The part numbers are to be seen in the fig. below.

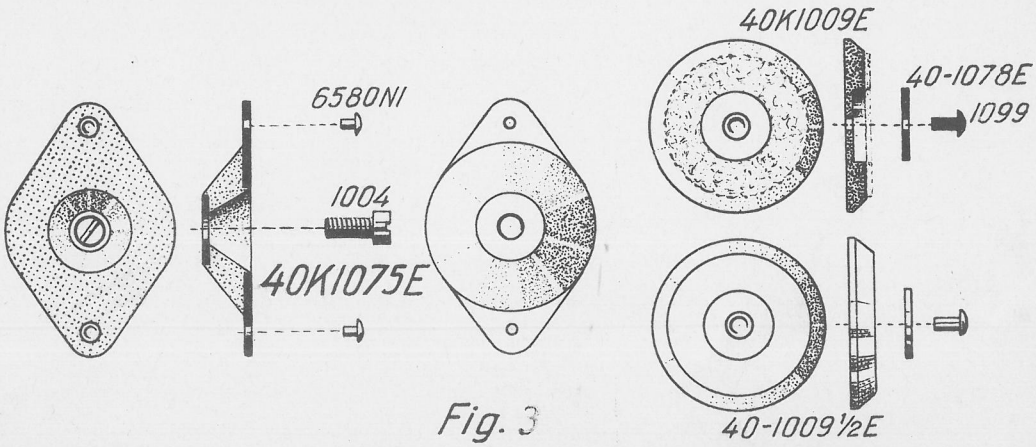


Fig. 3

Note

1. A number of electrical machines have been mounted on rubber bases. On such machines the Rubber Buffer on the Ribbon Feed Plate is number 1027N2, but the Bottom Cover which is now used, requires another buffer, namely 40-1027.

2. In order to avoid exaggerated vibrations on the dampers [40K1075E], a new part is used, namely Damper Cone 4052. This part is placed as per Fig. 4.

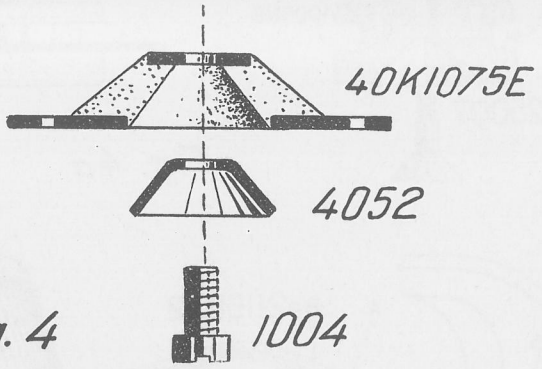


Fig. 4

3. To subdue the noise from electrical machines, the cover is now lined with plates of sound-insulating material. The fore plate is number 40F1001¼E, the rear 40B1001¼E, and the plates for the cover sides are number 40V/H1001¼E.

4. With a view to easier manufacturing, parts 40K1009E, 40-1009½E, 40K1075E [Rubber Feet and Dampers resp.], 6580N1, 1099, and 40-1078E have been replaced with four rubber feet of a new design, 40-1009. Bottom Cover 40K1074E has been modified a little at the same time and is now called 40K1074EN1. Screws for fixing the machine are 4054. Slippers 4055 are pasted on the bottom cover.

The new rubber feet can be used as replacement for the old dampers and feet if the hole for screw 1004, formerly used, is enlarged to Ø 25 and a Ring 4078R is installed as per Fig. 4a [see back of this page]. The rear feet [with felt] remain on the bottom cover but the fore ones are to be removed.

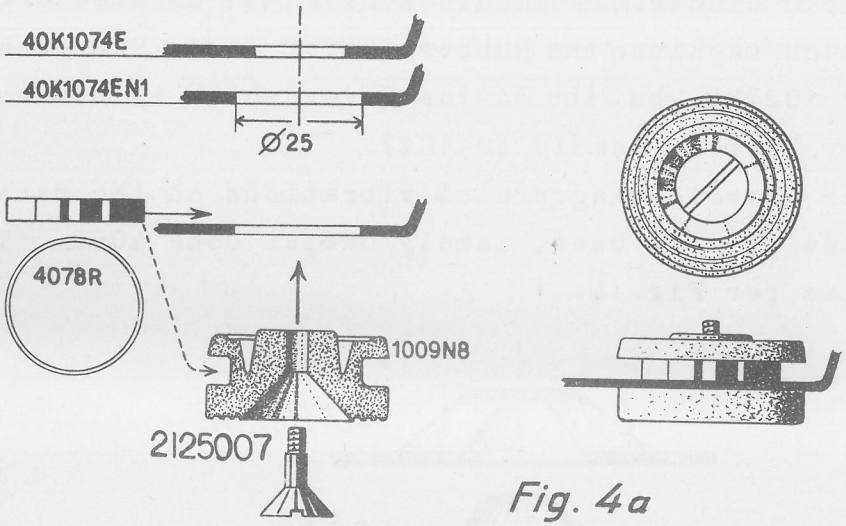


Fig. 4a

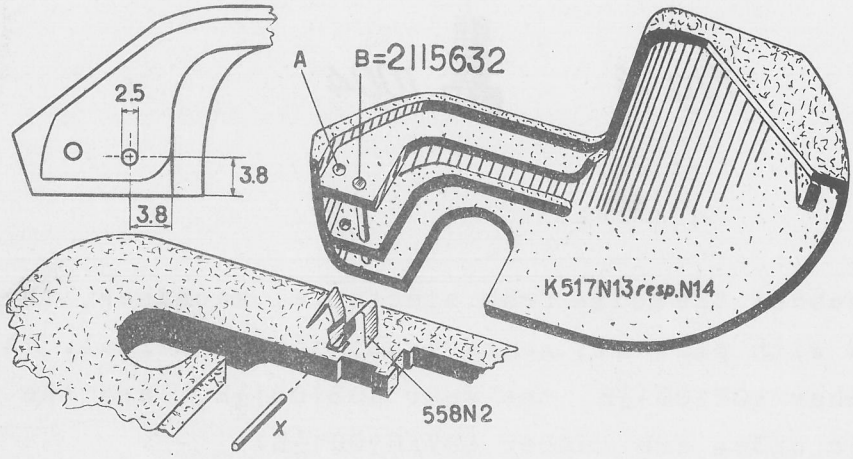


Fig. 4b

This Page replaces Page 4 X of 1.12.52.

A new Spring 558N2 for attaching the ribbon spool covers K517N13, -N14 has been designed. This spring can also replace Spring 558 on old machines. It is fixed in the square hole of the cover by means of Taper Pin X, Fig. 4b. [X is for Hand Machines 2112 002, and for El. Machines 2112 003].

When using the Spring 558N2 for replacing the 558 it will be necessary to bore the holes B as per Fig. 4 b and fasten the Pin 559 in the ribbon spool covers.

11.6.53

THE CARRIAGE

Removal

The removal is done after the same instruction as for the 80 series.

Installation

Set the Feed Rolls 1114 in the Feed Roll Holder 40K1117, noting that Spring Clips 7914N1 should be fully down in the grooves of Shaft 1132, and that they should not touch the holder. Put the platen space control, the paper release finger, and the platen between the side plates of the carriage frame, insert the platen shaft and fasten it.

Put in the line spacing control and spring detent roller, noting that there is a special Washer 8160½ outside the latter part. Insert the left hand paper guide, the fork around the centre support, and push in Shaft 3131 through the side plate and the tube of the paper guide. If the paper guide touches the cover, adjustment is made by filing the underside of the guide. Attach Spring 3132 between the guide and the spring stud in the centre support. The feed roll holder to be placed against the platen and fixed by means of Springs 3136, the backs of which should point towards the side plates of the carriage frame.

Notes

1. In the holder 3127N1 there is one Spring Pin 3128N1 and one Pressure Spring 3157, kept in place by Collar 3129. Some machines, however, were manufactured and shipped, before the pressure spring was introduced, and then the Tally Roll Shaft K1125 was slightly different from the one now used, K1125N7. If the old style shaft has to be exchanged for a new one, also the Holder mentioned above and its fixing nut must be exchanged [number 3127N1 and 3137N1 resp.]

2. The Tally Roll Shaft K1125N7 has been modified in order to reduce the number of parts necessary for its fixing in the left side of the carriage. The following alterations have been made.

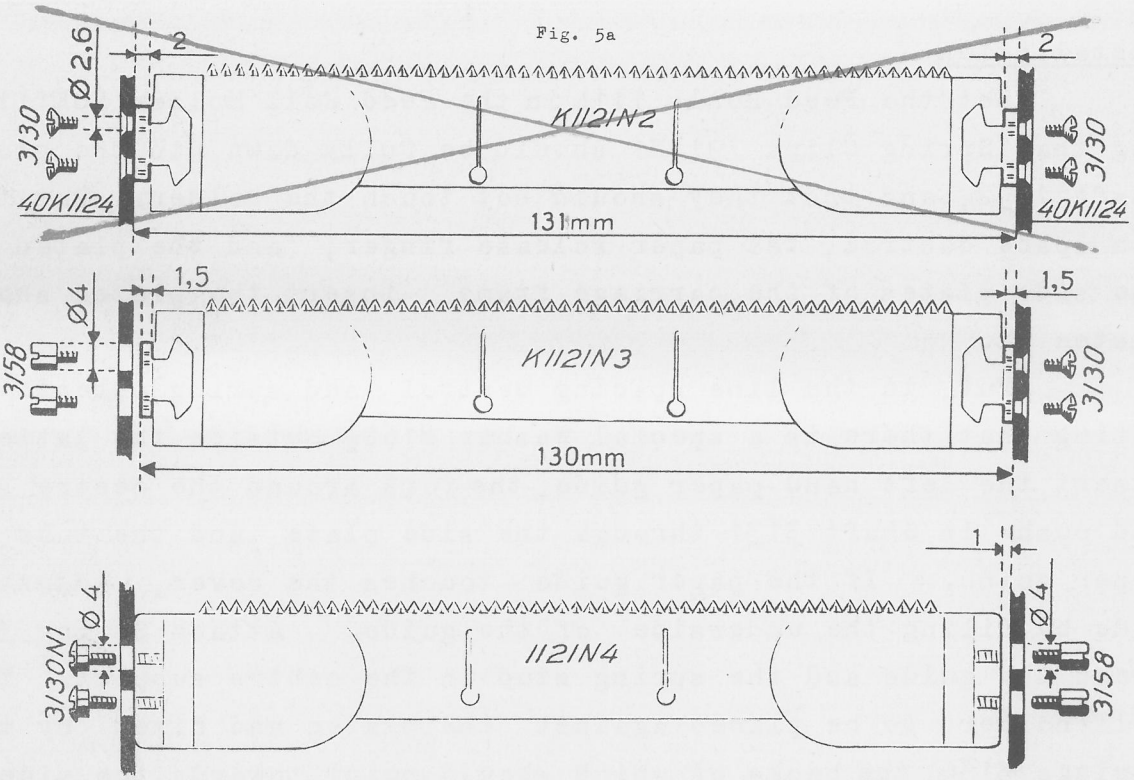
The tally roll shaft is redesigned and has number 1125N8. It is kept in place by Spring Clip 4110 and a special hub in the left hand carriage end. In a Carriage Frame thus modified, 40K1124N1, Shaft K1125N7 does not fit. As to installing 1125N8 in old carriages see back of this sheet.

This Page r... es Page 5 X of 7.15.52

The fixing brackets of Paper Knife K1124 have been modified so that the knife can now expand and contract in different temperatures. The modification will be evident from Fig. 5a (April 1952).

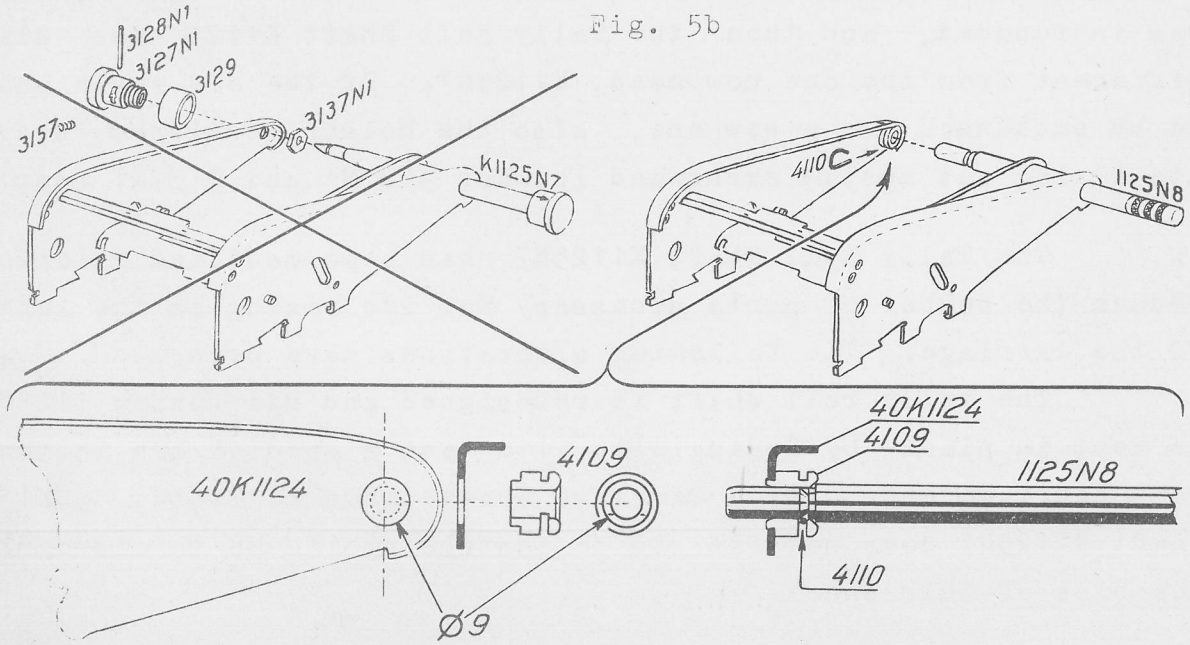
Paper Knife 1121N4 was introduced in December 1952. It is fixed in the left carriage end and moves freely on the right side in order to keep a determined distance to the platen ratchet wheel. N4 can replace both N3 and N2 if the fixing holes of the carriage frame are made ø 4.

Fig. 5a



Tally Roll Shaft 1125N8 can be used on older carriages if Hub 4109 is riveted to the left hand carriage end. Put the shaft in place before attaching Spring Clip 4110.

Fig. 5b



This sheet is to be inserted between Page 5 X and 6 X of the Service Manual for the 40 Series.

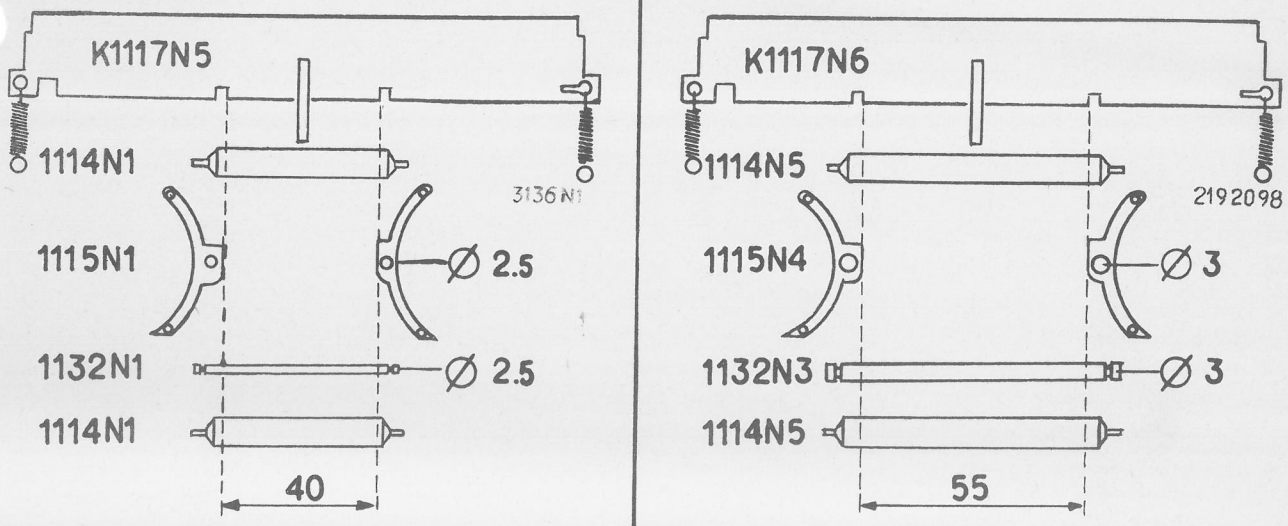


Fig. 5c

The figure to the left is showing the paper feed rollers hitherto used, the right hand figure showing the new rollers and holders which can also be installed in older machines.

Removal

Take off the carriage, and remove parts K1117N5, 1114N1, 1115N1 and 1132N1.

Installation on old machines

Part K1117N5 can be used together with the new rollers, if slots for the holders are made as per the right hand figure. In all cases, however, the notch of the carriage frame must be widened so as to allow free movement for the wider rear roller.

The wider Rollers 1114N5 require a stronger spring to be used instead of the formerly used 3136. The stronger spring has the number 2192 098 and as it can also be used on old machines Spring 3136 is no longer furnished.

The formerly issued page with Fig. 5 c is cancelled.

11.15.53

Removal

1. Remove the Key Top 40-257, which has two arrows on the top of it, and the Correction Key Top 40-308C.
2. Remove the Key Board Cover 40-3338, fixed with four Screws number 3151.
3. Remove all Key Tops and the Key Stem Guide 40-251.

This line of removing is the best if you want to take care of the enamel of the key board cover. Regarding Screw 1096 with serves as a support for the cover, see Note 1.

Other parts are removed in the same way as is the case on machines of the 80 series.

The following parts characterize the key board of the hand model machine.

40K233F, 41K233F Stop Carriage
40K216 Key Lever "0"
40-227 Key Stop
40-240 Indicator Lever
40-240½ Key Top
40K249 Key Board Frame
341-251 Key Stem Guide.

See Page 254 in the Spare Parts List.

Installation

Installation is performed in the same way as in the 80 series with the exception of the repetition key. This key, namely, must be set on Shaft 267 before the key board is put in place. Spring 283F to be attached between the repetition key and the Total Locking Lever 40K279 [see Fig. 6].

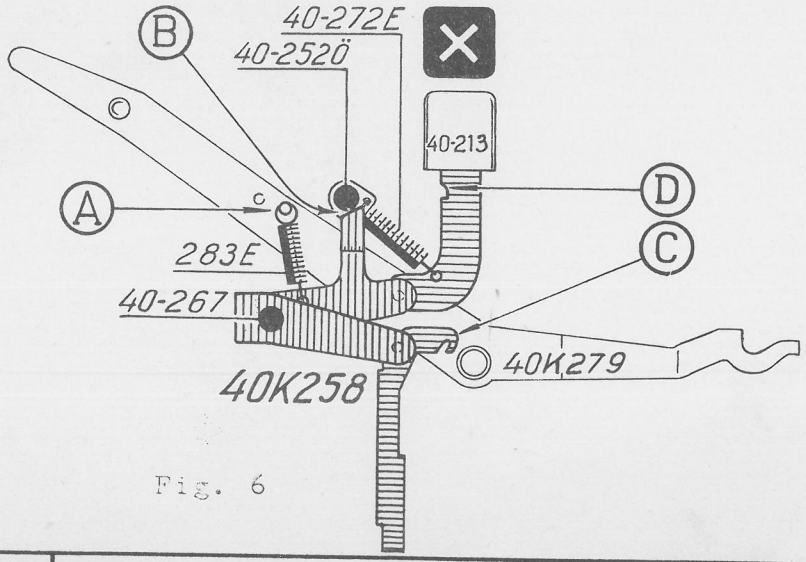


Fig. 6

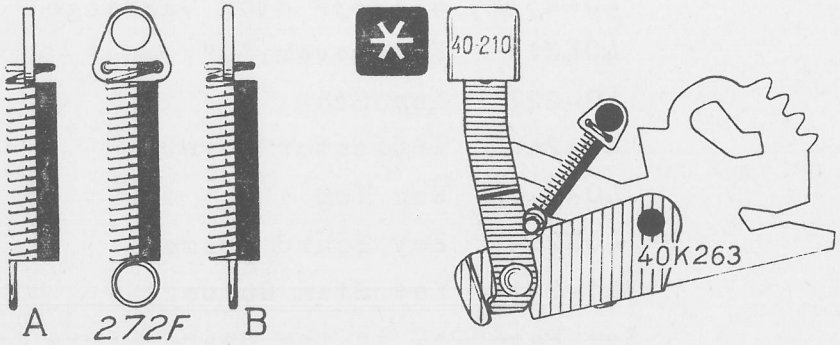


Fig. 6a

The upward movement of the repetition key is limited by the upper key board shaft [at "B"]. The spring hook ["C"] is not used at present. The notch at "D" keeps the key in down position when pressed towards the rear of the machine.

When inserting Shaft 40-252Ö it should be checked that Spring 272F [not 40-] in the Total Key has the last loop in the centre of the spring as per Fig. 6 - A.

The key board differs only little from that of the 80 model, and the principal modifications concern the black-coloured parts in the fig. below. As is evident from this figure, the obstruction of 40K230E has been improved by introducing an additional stop slide working at the lug C of the escapement bracket. Both 40K282 and 40K294 are put in position by the step link,

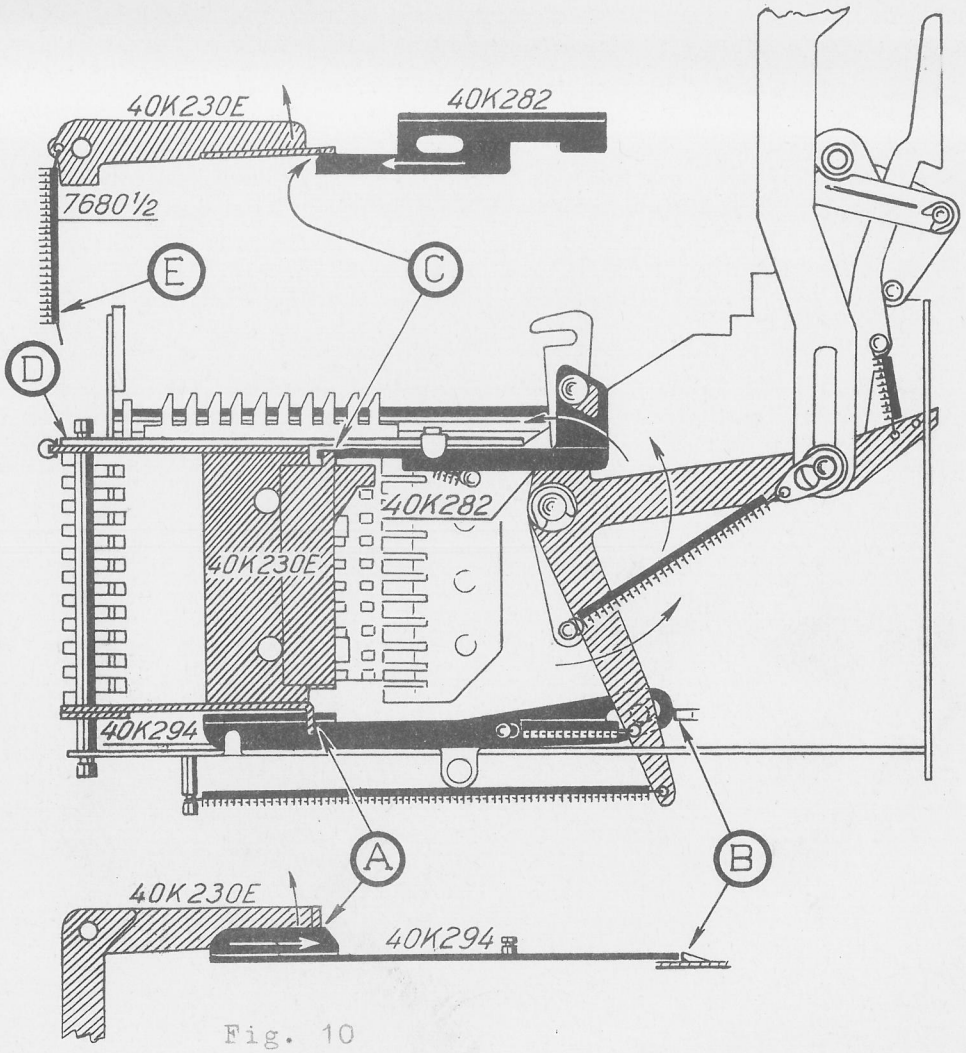


Fig. 10

shortly after the beginning of the stroke, and restored after the stop carriage has come back to normal. These devices are completed by the 40K305E which slips in under the escapement bracket as soon as the machine starts running, see Page 12 X. The Blocking Bridge Catch 40K3334 is there to secure that a repeated start on the addition key does not cause the stop carriage to be stopped in any intermediate position by 40-247.

Removal

Removal is performed in the same way as in the hand model machine, after the starting levers have been detached. Replace the upper key board shaft with a timing rod in order to avoid unnecessary trouble with the parts thereon.

Servicing

When part 40K305E is restored by the stud of the crank shaft, it takes the Blocking Bridge 40-247 out of mesh with the stop carriage, thus allowing it to be zeroed. The Blocking Bridge Catch 40K3334 catches the bridge and keeps it from the stop carriage when the 40K305E has been restored but not locked by Latch 40K4207, i.e. in Total and Sub-Total. Adjust by bending the lug at "B" so that the play between stop carriage and blocking bridge is as small as possible.

At A and C, Fig. 10, the parts should slip smoothly in under the escapement bracket, and there must be as little play as possible.

The stop B, Fig. 10, together with the slot of the Escapement Bracket Lock 294 enables the Step Lever and Return Step Hook to restore the stop carriage, also in case the escapement bracket lock is obstructed by the escapement bracket for one reason or other.

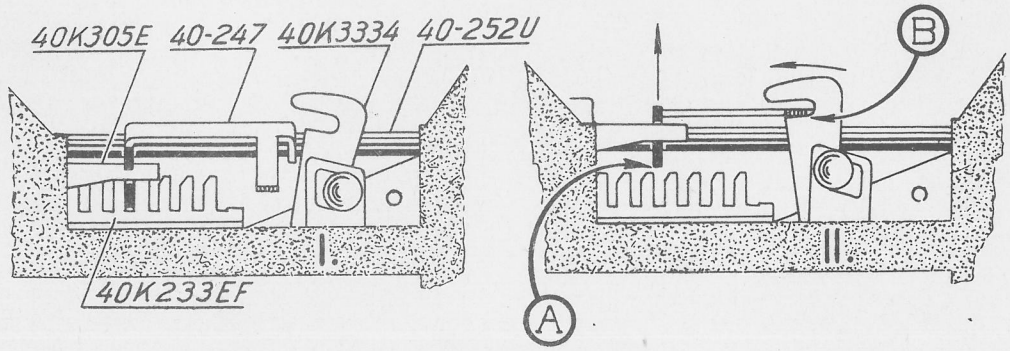


Fig.11

In order to ensure that the numerical keys are blocked at the same time as the machine starts, it is arranged that both operations are carried out by the 40K305E. When the machine starts this part is pulled in over Escapement Bracket 40K230E, thus making it impossible to depress any numerical key.

With this arrangement it is also clear that the keys are obstructed during the whole machine stroke. The parts work as per the adjoining figures.

1. Both addition and subtraction keys as well as all numerical keys are in normal. The machine has not yet received any starting impulse.

2. Addition and subtraction keys in normal, one numerical key depressed, but not yet any starting impulse.

3. The numerical key is still depressed, but now also one motor key [e.g. the addition key]. Thus, the machine has got the starting impulse, but cannot start, as the 40K305E stops on the escapement bracket.

4. The numerical key has been allowed to ascend, thereby allowing the 40K305E to go fully forward, block the escapement bracket, and start the motor.

5. This sketch illustrates what should not happen. Conditions as in point 4, but the 40K305E has stopped towards the side of the escapement bracket. This prevents the motor from being started until the bracket is pushed down. As regards repair see next page.

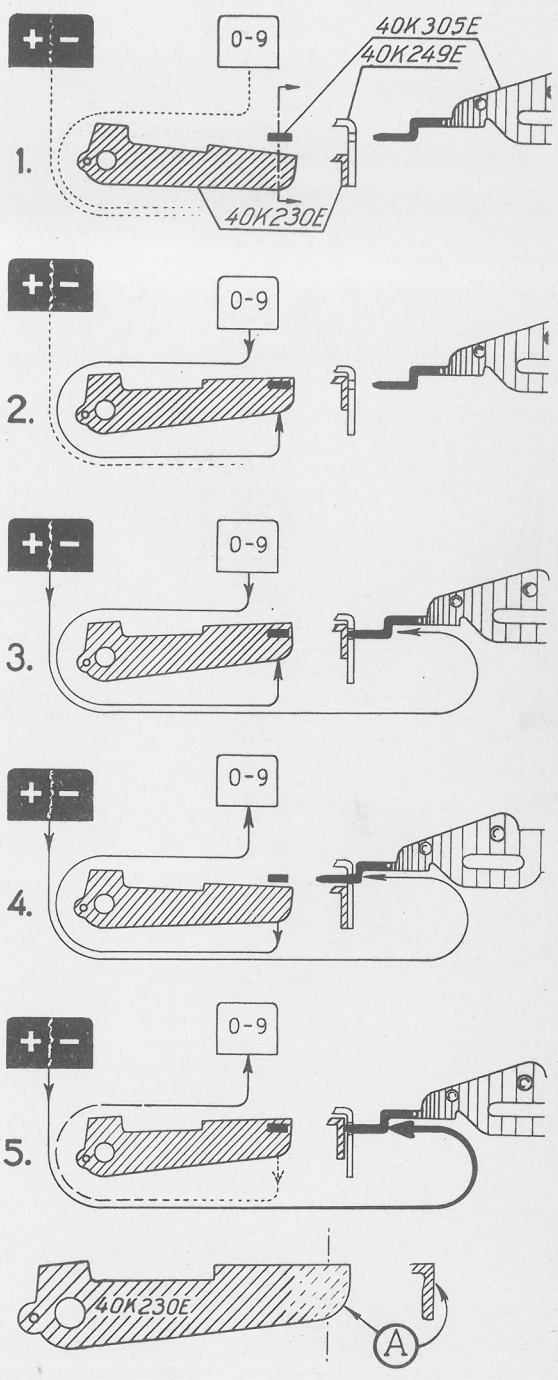


Fig. 12

Repair

If the machine should get blocked as per p. 5, the fault is remedied as follows:

Unhook Spring 7680 1/2 from its spring stud.

Lift the escapement bracket and check that it falls back by itself.

Adjust the bracket so that it comes as close to the flange of the key board as possible. Then it will be necessary to check that the guiding lug between the Stop Actuating Bar 228V and the escapement bracket does not allow any lateral play of the latter part.

See that the nose of 40K305E is rounded and smooth, and apply some grease to it. The corresponding surface (A) of the escapement bracket also should be smooth so that friction is avoided as much as possible.

In some cases it may be justified to cut off one or two loops of Spring 7680 1/2. The touch will then be a little heavier but, at the same time, more distinct.

Note

In order that the step lever should have as uniform a spring load as possible we made a new and longer key board front spring. This new spring, which is number 2193124, is anchored on Shaft 229N2 as shown in fig. 13.

When replacing the formerly used spring 2193112 by the new one 2193124, also Shaft 229N1 must be replaced by 229N2, and the spring stud removed.

Machines coming from the assembly line after July, 1955 are equipped with Spring 2193124.

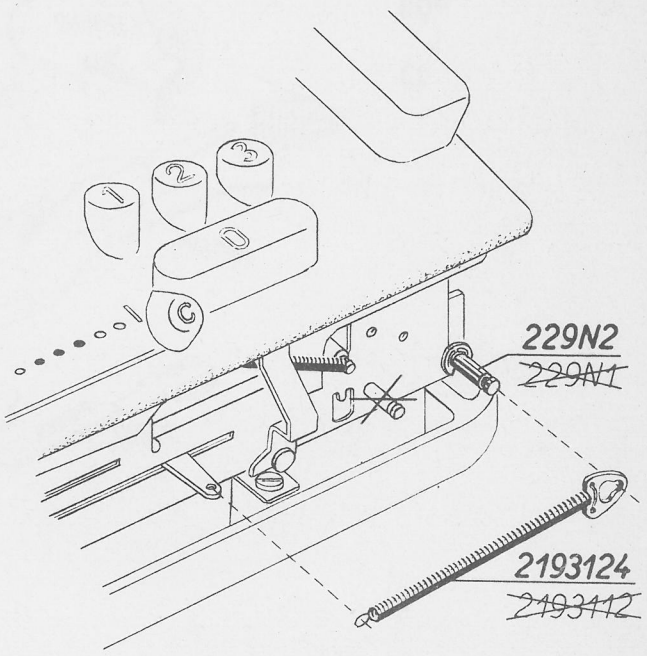


Fig.13

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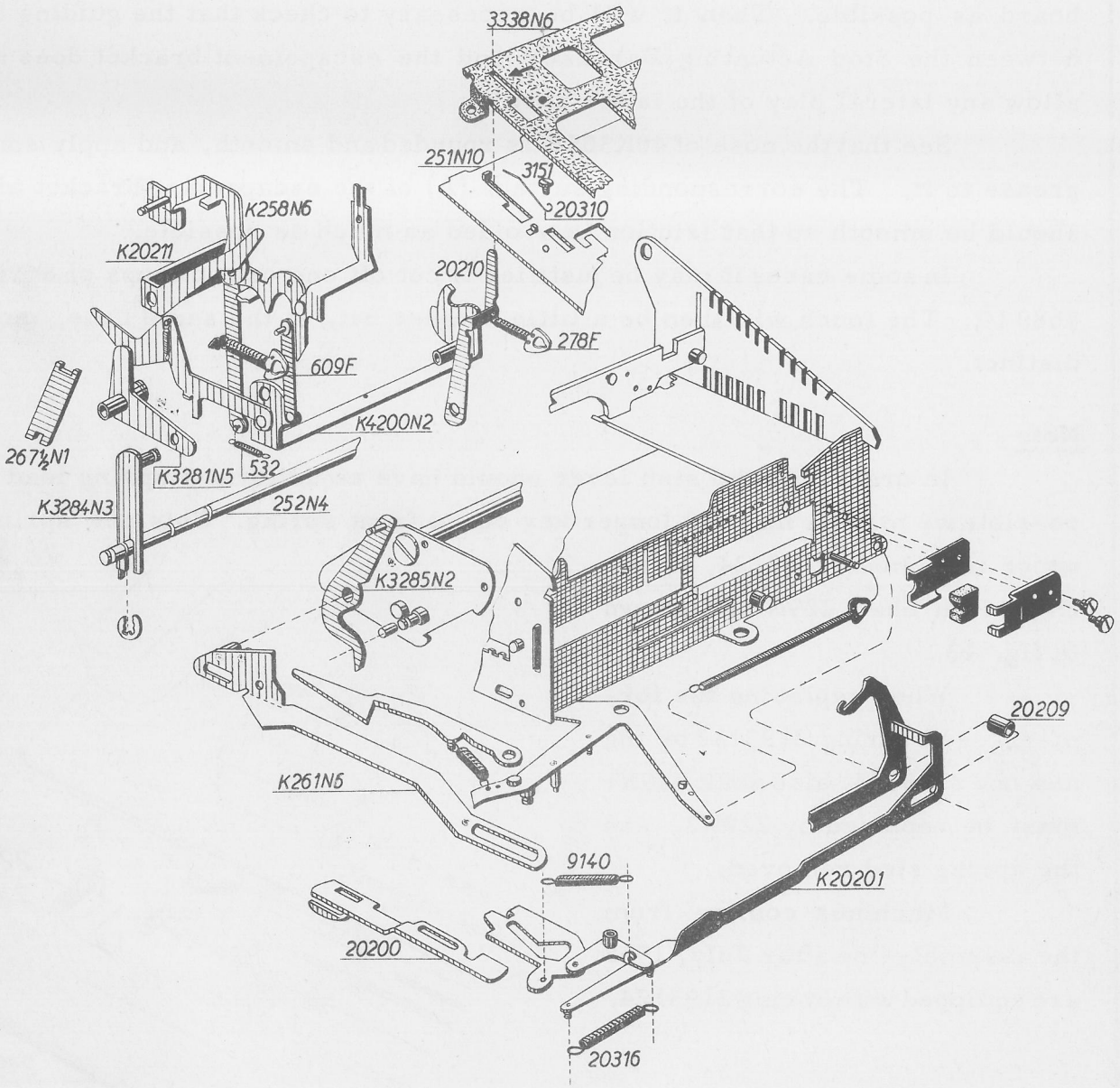

3338N6
251N10
315
20310
K258N6
K2021
20210
278F
609F
K4200N2
267½N1
K3281N5
532
252N4
K3284N3
K3285N2
20209
K261N5
9140
K20201
20200
20316

Fig.13a

5. The guiding of Buffer Mount 40-3327 has been uneconomically accurate. Therefore, the shoulder of Screw 40-3328 now has been made lower, so that only the buffer holder is guided. At the same time the holes in the buffer mount are made smaller. When exchanging screws also a new buffer mount must be fitted. The old screws will no longer be furnished. The new screw has number 3328N1 and the new buffer mount is 40-3327N1.

6. Due to a mistake there have been put faulty Stop Carriage Buffers 40-3325 into a number of machines. The fault may cause the same misfunction as is described in "3", so you are advised to control the part in question when overhauling machines.

7. As the way of fixing the key board on the base plate shall be altered, the Blocking Bridge 40-247 has already been made the object of a modification. Until the alteration is completely carried out, a special Blocking Bridge Catch 40K3334N1 and a special Step Lever 40K282N1 will have to be used with the modified Blocking Bridge 40-247N1. The parts in question are all illustrated below.

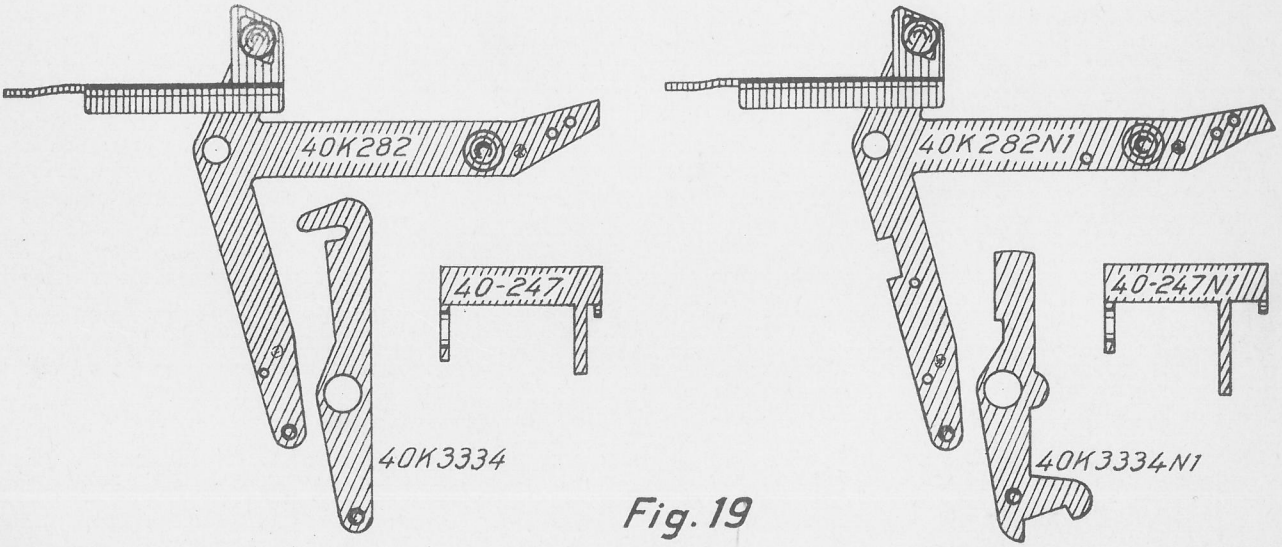


Fig. 19

Escapement Bracket K284

When assembling the key board of electrical machines equipped with the new Key Board Fixing Shaft 1098 it will be necessary to control that Return Step Hook K284E is filed ff to allow Spring 283E

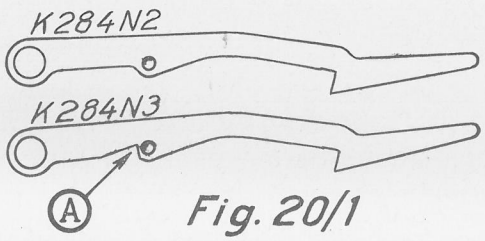


Fig. 20/1

to be attached with the coil pointing towards the key board bottom. [The part should look like K284N3]. If the Spring is installed otherwise it will be squeezed between the fixing shaft and the return step hook. The stud for attaching the spring will be moved within short to avoid the trouble. [Page 222 of the Spare Parts List].

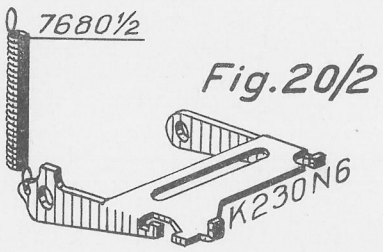


Fig. 20/2

Escapement Bracket Spring

From machines no. 341E-B89300; 41E-B89443; 40E-B89492; 42E-B89390; 345E-B89253 and 5341E-B70027 to machines no. 341E-C87095; 41E-C86752; 41EA-D80597; 40E-C89594; 42E-D80431; 345E-D80185; 5341E-B70485; 341EA-D80429; 40H-C84755; 41H-C89643; 42H-C89638 and 341H-C89618 Spring 3392 was used for the Escapement Bracket. However, machines with and after the last mentioned serial numbers are again equipped with the formerly used Spring 7680½. See Page 134 X.

THE LEFT SIDE

The ribbon and paper feed mechanism and the print trigger actuator is assembled on the left hand side of the machine. These parts together are called Feed Segment. The firing of the printing mechanism is timed on the lug "A". The sign bar which is the last to print, should be actuated just before the end of the first half-stroke.

The length of the movement of the Paper Feed Hook K1142N2 is set by bending the tail B. The stud must never work dry.

The ribbon is fed by the arm D.

The parts connected to the key board will be seen on the right hand part of Fig. 21. Above E is the roller that is caught by Return Stop Hook K284E for zeroing the stop carriage. F is the repeat key stem which prevents, when depressed, the K284E from catching the roller.

Note the projection C of part K277, espacially on old machines. If it has a tendency of hitting the stud of part 40K3262N1 it should be filed off for free movement.

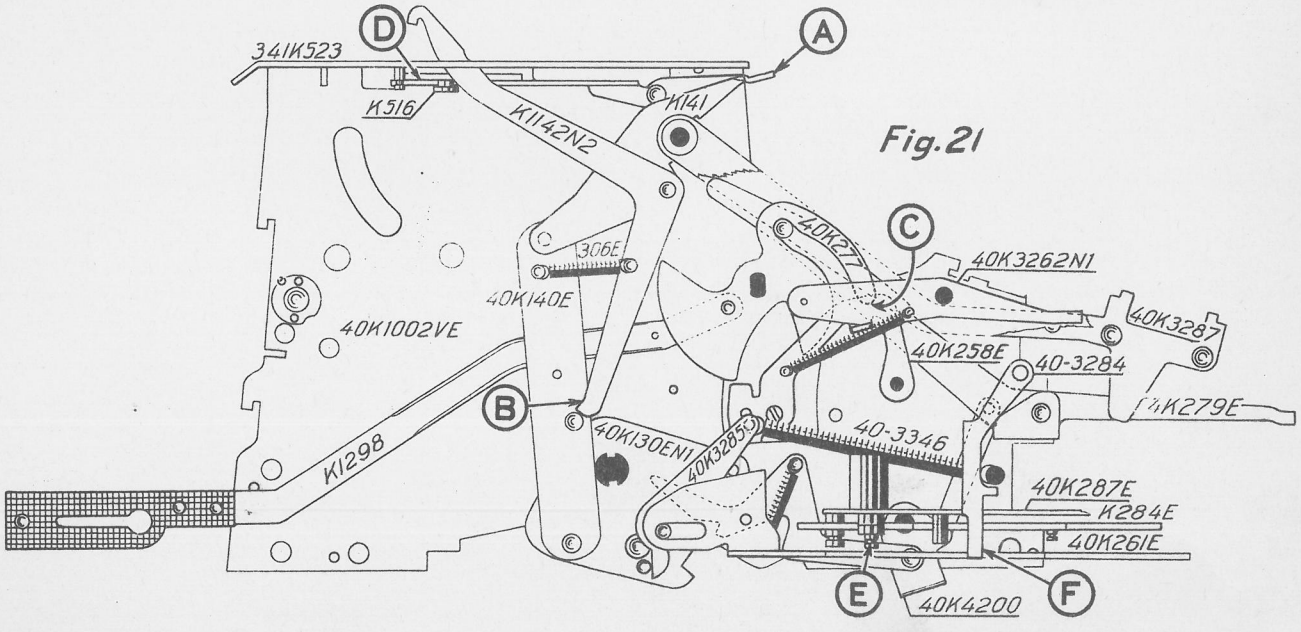


Fig. 21

The bearing of the Total Locking Lever has been modified in order to make the part more rigid. Then the Starting Bridge Actuator and Shaft 40-279¼N1 were slightly modified too, and the new numbers are: 40K279EN2, 40K3256N2, and 40-279¼N2 respectively. The modified parts, illustrated below, cannot replace the formerly used parts independently.

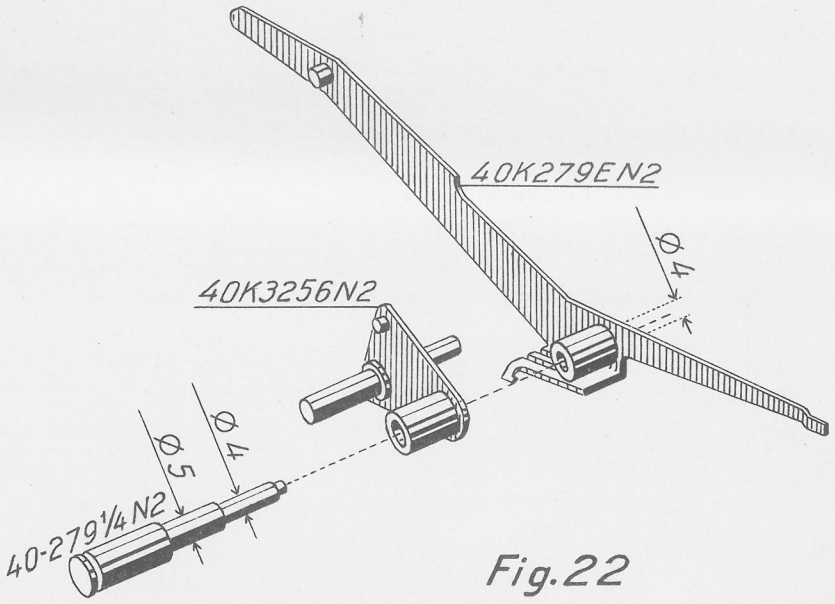


Fig.22

Modification of machines where Spring 2192112 (3163) has broken

If spring 2192112 should break in a machine that has already been modified as per Page 16 X (Fig. 15 a) you have the possibility of improving also this (3163) spring arrangement as per the following description.

1. Remove the stud that used to be a spring anchor for 2192112 (3163).
2. Dismount the Feed Segment 40-139 and knock out the stud (positioned where the stud marked with a star on Fig. 23/2 is to be riveted).
3. Cut off the segment as per Fig. 23/1. Use the special Pattern R335 to get the right measure.
4. Fasten the Spring Anchor K3177R, using a stud according to Fig. 23/3 as a rivet. Note that there is a stud on part K3177R to come into a hole of the feed segment.
5. Attach the Buffer K3173, and the modified feed segment to the main shaft by means of the shoulder screw 2121420. Note that the Roller 2294044 is to be placed on the stud of K3173, and that this stud should fit into the hole of the "ex-spring-anchor".
6. Now, insert the Spring 2194 035 on its Core 3175 between parts K3177R and K3173, the flange of the core facing K3177R.

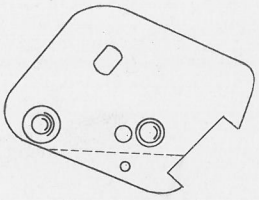


Fig.23/1

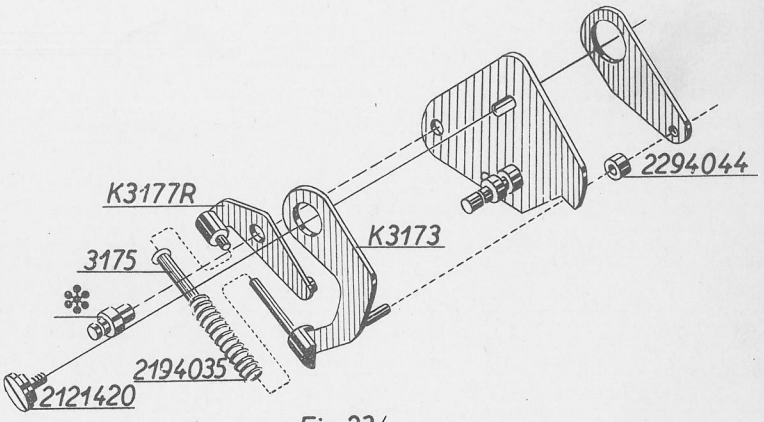


Fig 23/2

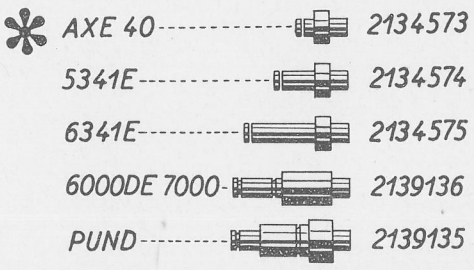


Fig.23/3

Automatic spacing after Total and Non-Add.

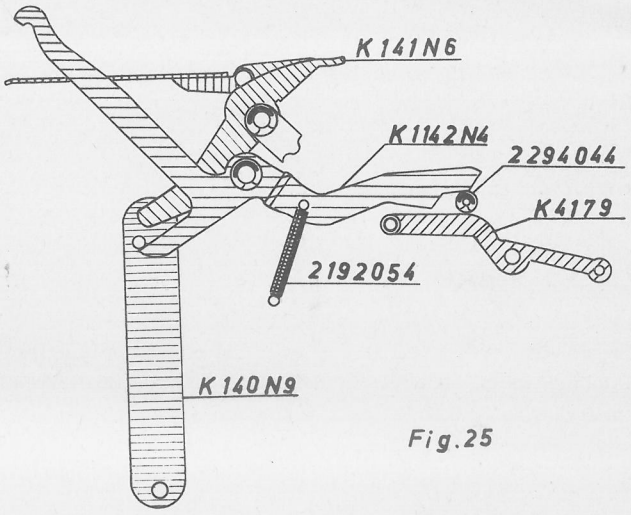


Fig.25

The parts for line spacing have recently been re-designed in order to eliminate the blank space before Total and Sub-Total, and to get such a space after Total and Non-Add instead.

Function (el. machines)

With the previous system of line spacing the Paper Feeding Hook K1142N3 was made to feed the platen one or two steps according to the position of the Line Space Control Lever K1130. In new machines the hook is made to space two spaces (three with line space lever in lower position) when let alone to work on its own will. However, there are two rollers to control the movement of the new Paper Feed Dog K1142N4. One is positioned on a new lever, the P.F. Disengaging Lever K4179N1 (K4179N3 for Hand Model machines), and the other (number 2294044) on the left side of the totalizer support. The disengaging lever is actuated by the Sector Stopping Arm Latch (K3335N7 for Model 341E) so that when the latch goes down during the automatic restoring stroke the roller end of the disengaging lever will come up lifting the feed dog out of the path of the ratchet wheel. The roller on the totalizer support serves the purpose of disengaging the feed dog from the ratchet wheel one tooth before completed stroke, when the totalizer is in its forward, i.e. engaged, position. From the above description it should be understood that the paper will be fed one space in add, subtraction and sub-total (the totalizer being in its forward position in the feed moment), no space restoring stroke (the disengaging lever roller in upper position) and two spaces in Non-Add and Total (the totalizer being in disengaged position).

When the line space control lever is in its lower position the platen will be advanced one more space in all operations excluding the restoring stroke.

Hand model machines

Line spacing is almost the same in hand machines. But here, there is no P.F. Disengaging Lever. The lever K4179N3 that is installed in such machines looking as same, is merely a stop that should prevent the tail of the paper feed dog from getting down below the roller of the totalizer support. Consequently, the paper will be advanced one space on the spacing stroke before total and sub-total, but two after total and non-add.

Caution: When running the machine without carriage always unhook Spring 2192054 and take off the Roller 2294044, else the tail of the paper feed dog will get caught on the roller and cause distortion. This applies to all machines with extra spacing after total and non-add.

New Parts

Hand model machines:

K140N10	Feed Link
K141N6	Upper Feed Unit
K1124N4	Paper Feed Dog
K4179N3	Dog Stop
2192054	Spring for K1142N4
2194044	Roller for totalizer support

Electric machines:

K140N9	Feed Link
K141N6	Upper Feed Unit
K1142N4	Paper Feed Dog
K4179N1	P. F. Disengaging Lever
2192054	Spring for K1142N4
2194044	Roller for totalizer support
K3335N6	Sector Stopping Arm Latch 40E and 241E
K3335N7	Sector Stopping Arm Latch 341E
2193117	Spring replacing 2193110 on K3312 in 341E

This feature and these parts cannot be installed on machines with serial numbers below these:

40 - J87749	40E - J87608
41 - J87716	42E - J87476
42 - J87686	241E - 500023
341 - J87648	341E - J87212
	345E - K87156

The Totalizer Support K909N4 and Fifth Link K3261N1 also have been modified but can be used in earlier machines too.

THE RIGHT SIDE

Hand Models

If the Handle has to be forced in bottom before it returns,

you are advised to modify the last tooth of the Full Stroke Ratchet K122 as follows:

1. Shorten the tooth so that the top becomes .7 mm only.
2. Shamfer two teeth to a thickness of 1.5 mm. See Fig. 30

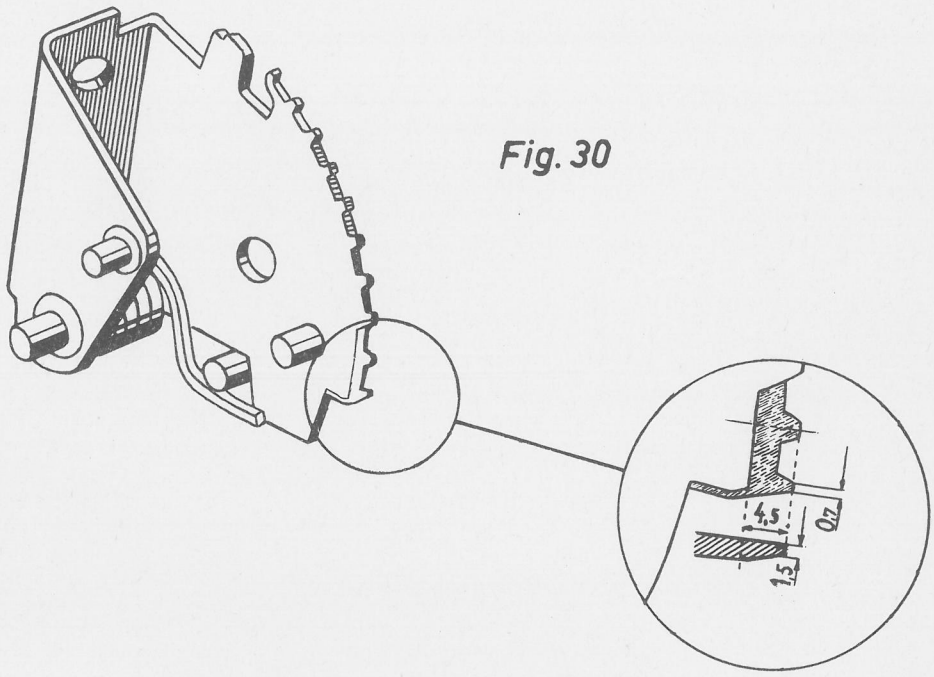


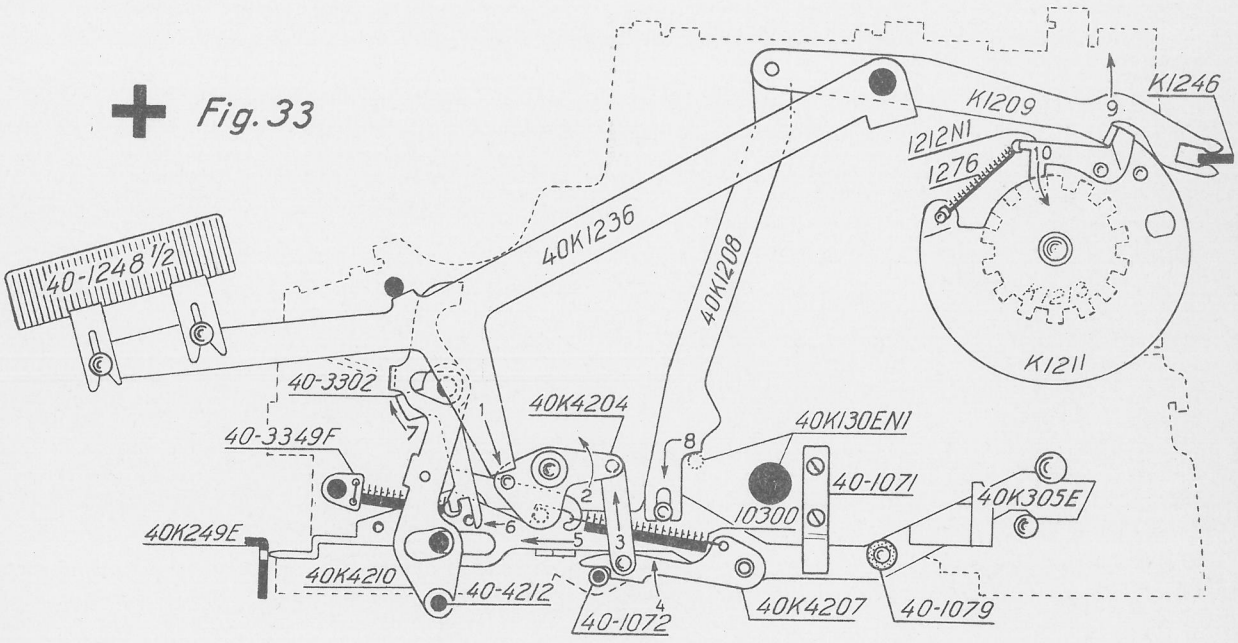
Fig. 30

Recently manufactured machines are equipped with a handle, the hub of which is rotated by 10 degrees in order to provide an initial position of the handle more towords the rear of the machine. Consequently, the handle need not be pulled so for forwards as before.

In adding

Depressing the Starting Lever 40K1236 rotates the Start Lever 40K4204 through the long tongue. The link (with arrow 3) thereby lifts Latch 40K4207 over the Roller 40-1072. This allows the Springs 10300 and 40-3349F to draw parts 40K305E and 40-3302 towards the key voard. Then the Start Balance 40K4210 is blocked as is also the case with the numerical keys (see Page 12).

Fig. 33



As the 40K305E was drawn forward, it took Starting Bar 40K1208 with it, allowing it to slip off the stud of the right hand driving segment where it rested. Thus the Contact Bridge K1246 can push the Starting Lever K1209 upwards so that the starting ratchet meshes with the ratchet wheel, and start the machine.

Numerals and arrows give the succession and direction of the movement of the parts.

The restoring impulse comes from a stud riveted to the Connecting Rod 40K1205. This stud, namely, actuates the 40K305E on surface F, pushing it back so that the latch can slip down on Roller 40-1072 again. The latch must be drawn .3 - .5 mm past the roller, which measure can be obtained by adjusting at "F". Stud K lifts the starting bar so that Starting Lever K1209 disengages the starting ratchet [G] and breakes the current.

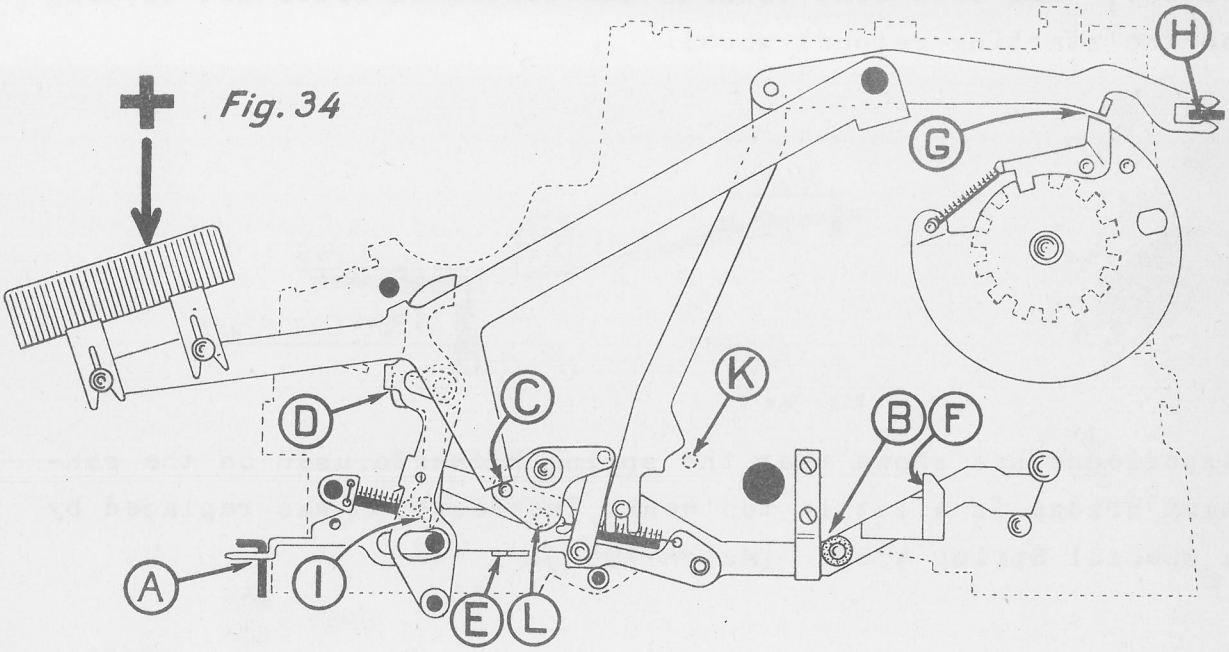


Fig. 34

Servicing

A. 40K305E runs through a hole in the key board frame bottom, see Pages 12 and 13.

B. This felt pad is a stop for 40K305E. Exchange the old rubber collar for a felt if this has not already been done.

C. The distance between this stud and the tongue of the Starting Lever 40K1236 should be as small as possible before the key is depressed. But it should be checked that the stud does not hit the tongue when the Start Lever 40K4204 is restored, because, if this should happen the machine may make an extra stroke. Adjust on 40K1236.

D. The Start Balance Blocker 40-3302 gets in under the lug of the start balance and prevents it from being moved [in addi-

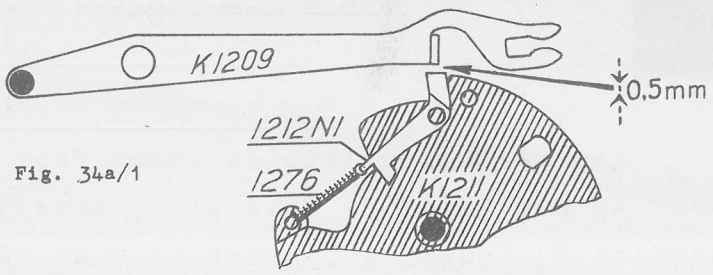


Fig. 34a/1

Adjust the Starting Lever K1207 as per the above figure, which illustrates the parts after the motor key has been depressed. Then the play between K1209 and 1212N1 should be .5 mm. Adjust on the Contact Bridge K1246.
On Spring 1276 the loop [normal size] that is attached to part 1212N1, has been bent towards the centre in order not to drag on the starting ratchet wheel.

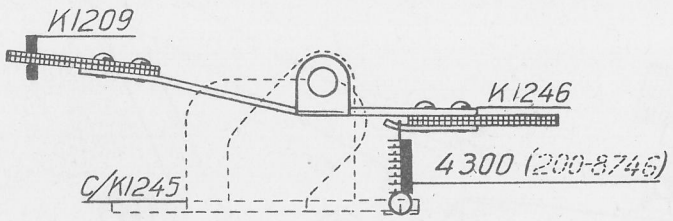


Fig. 34a/2

Experience has shown that the spring hitherto used on the contact bridge is a little too weak. Therefore, it was replaced by a special Spring 4300. [March 1951].

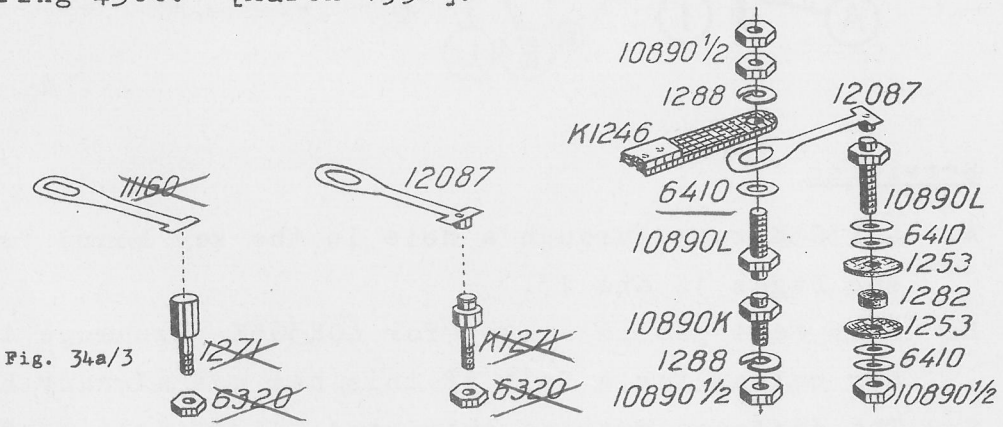


Fig. 34a/3

The condenser current breaker points having been burnt on some machines are now provided with plates of a wolfram alloy. The modified parts 12087 and 10890L can be fitted to old machines and, therefore, the 11160, 1271, and K1271 are no longer furnished as spare parts.
Note the Washer 6410 under 12087.

Owing to a mistake one set of condenser current breakers have been manufactured of a material that is not elastic. These are unusable and must be substituted.

tion and subtraction starts]. See Page 91.

E. After the machine has been started for add., this lug stops starting impulses from the left side of the machine. For example, if you depress the subtraction key after the addition key, the Starting Bridge 40K4200 will run against the underside of the lug. The lug will also be a stop for the Non-Add key.

F. The stud of the Connecting Rod 40K1205 restores the 40K305E by working on this surface. Note that if 40K305E is moved so much against the rear that the Latch 40K4207 comes more than .5 mm behind Roller 40-1072 the latch may jump up when it is released, causing the machine to make an extra stroke.

G. The play between the Starting Lever K1209 and the ratchet must not exceed .5 mm after any motor key has been depressed. See Fig. 34a/1.

H. Contact Bridge K1209 to be so positioned as is shown in Fig. 34 - it is not allowed to be at the bottom of the slot.

I. This stud receives the spring tension from 40-3349F via the Start Balance Blocker 40-3302.

K. On this stud of the right hand driving segment rests the Starting Bar 40K1208 until the machine is started.

L. This stud [on the start lever] has no function in this connection, but it is important that it does not stop against the latch of the start balance when the start lever is restored. If this should happen, namely, Latch 40K4207 cannot come down on Roller 40-1072 and the machine starts again. Adjustment to be performed at "F" or in the notch at "L". But the maximal play of .5 mm at F should always be maintained. After the motor key has been depressed, there must be no contact between the start balance latch and the stud "L".

Notes

1. Machines leaving the factory after March 15th, 1951, have Spring 4300 instead of 200-8746 on the Contact Bridge K1209. Can also be used in machines of earlier date.

3. The stud "B" of the Centre Shaft 40K601 has been lengthened in order to provide better engagement with the latch "A". At the same time the latch was modified as per Fig. 36.

To give free movement for the lengthened stud, Starting Bar 40K1208 had to be redesigned as shown below.

In connection with the above modification also stud "C" of the Main Shaft was altered to ensure that the starting bar cannot slip down and start the motor when the motor key and a numerical key are depressed at the same time.

Of the parts mentioned only the Totalizer Coupling 40K806E with the new latch can be used on old machines. The other parts have got N-numbers as they cannot be used on machines manufactured before the modification was put into production.

Centre Shaft 40K601N1	In production from:
Starting Bar 40K1208N1	40E-A36995,
Main Shaft 40K130EN3,	41E-A87215,
	341E-A87150,
	341EC-B35009.

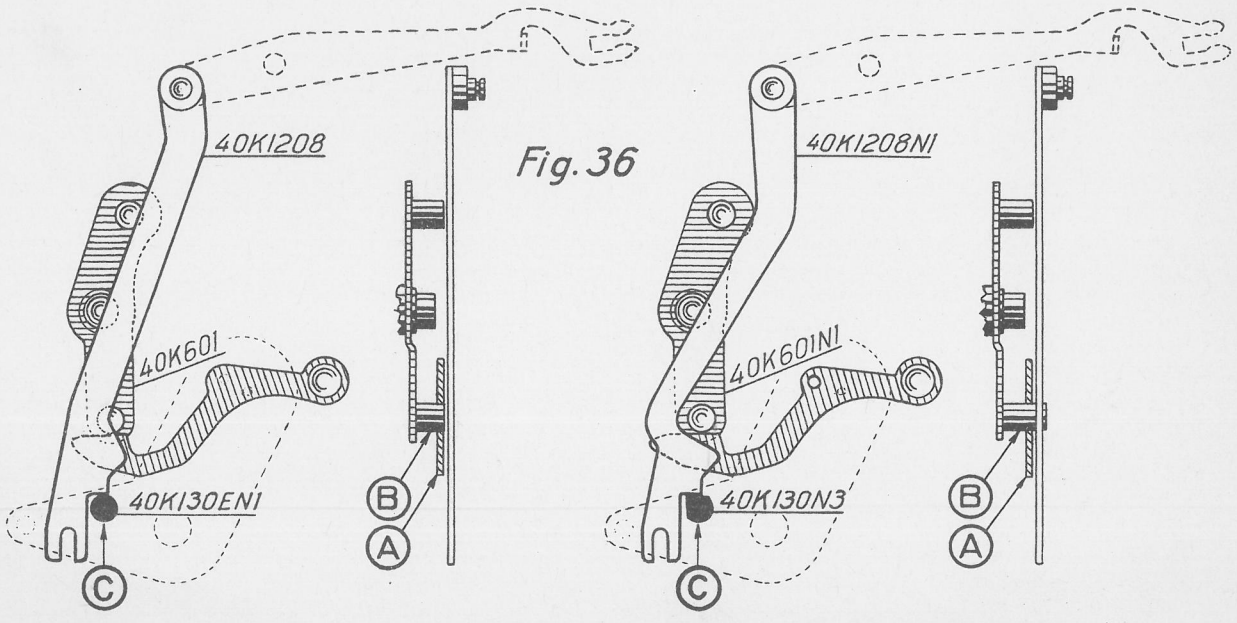


Fig. 36

4. To provide better engagement the Start Lever 40K4204 has been slightly modified as regards the studs. The modified part has number 40K4204N1, and it cannot be used on machines prior to: 341EC - A85084, 341E - A86717, 41E - A86272 and 40E - A86900.

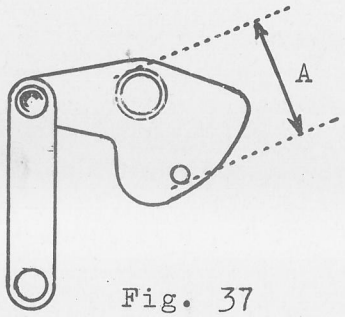


Fig. 37

On 40K4204 the distance A is 14.5 mm; on 40K4204N1, 13 mm.

[Misprinting [Addo-X 40E Series 500.000.]

Adjustment

Widen the fork of Part K1209 to 5 mm.

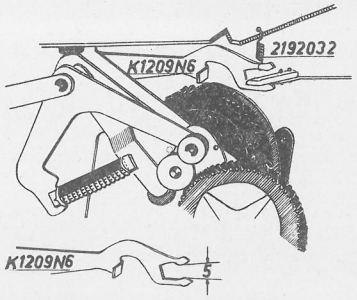


Fig. 38/1

Put on Spring 2192032 between the fork and the Top Plate.

Set a distance of .5 mm [machine started] by forming the Contact Arm.

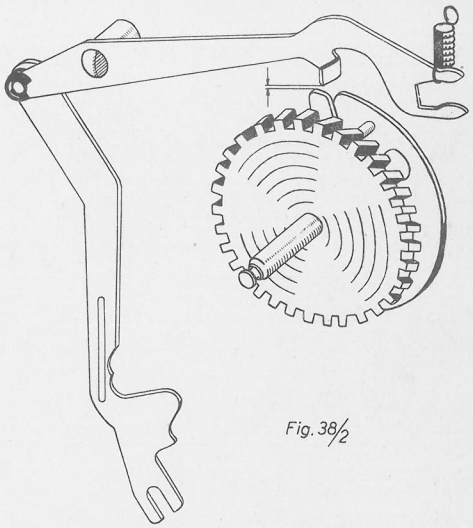


Fig. 38/2

Recently manufactured machines are equipped with modified Start Arm and Spring 2192072. Do not install Spring 2192032 on such machines. Contact Arm to be adjusted so that a distance of approximately 1.5 mm between contact points is maintained.

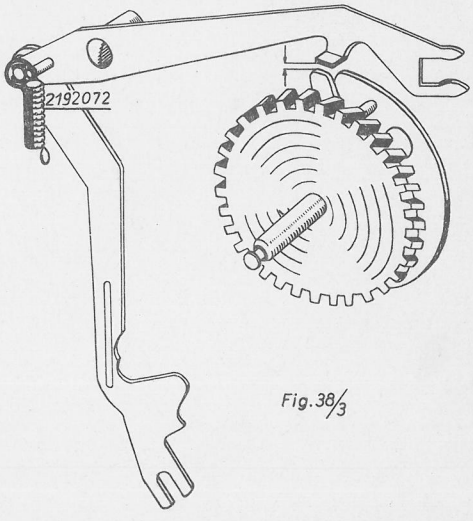


Fig. 38/3

This page r... es Page 38 X, June 1956

THE START

Make positive that the machine is modified as per the first paragraph of Page 139 X. Remove Balance Spring 2192993 if there is one.

Set the Step-O-Matic Lever in "Off" position.

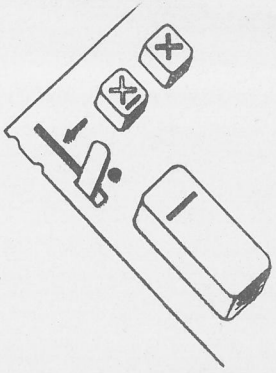


Fig.39/1

Actuate the machine by hand until the Starting Ratchet engages in the Ratchet Wheel.

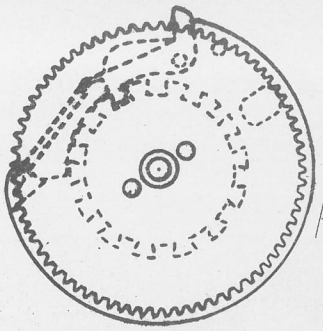


Fig.39/2

Mark the position of the starting ratchet on the ratchet wheel as shown at "A".

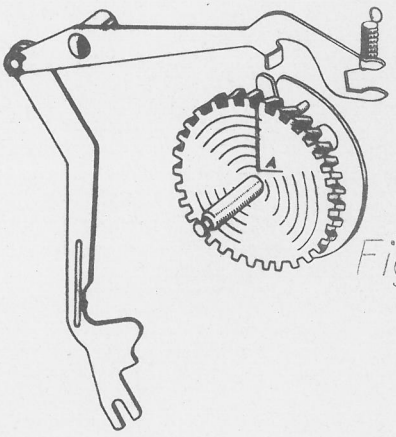


Fig.39/3

Let the machine make about twenty repeat strokes under power and pull out the plug KEEPING THE REPEAT KEY DEPRESSED. Check if the starting ratchet has retained its position in relation to the wheel. If it has not, shorten the lug [Fig. 39/4] a trifle where the arrow points [lower edge]. Check again as per above. When you have reached the point where the starting ratchet does not disengage during operation [check with various number combinations] stop filing, and install the Balance Spring 2192993 or 2192807. [See Page 142 X.]

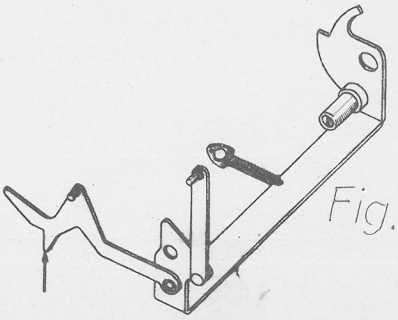
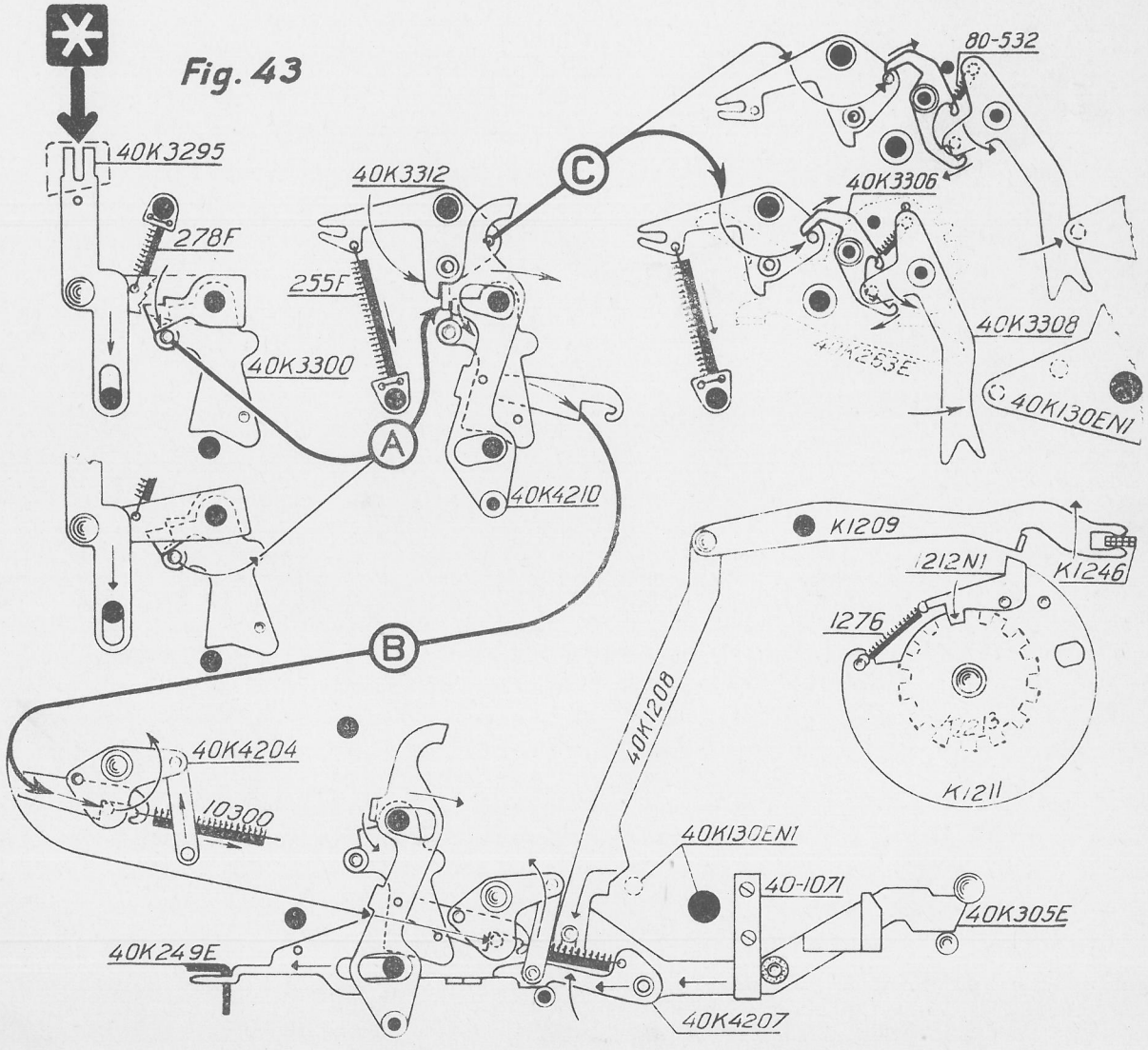


Fig.39/4

This page replaces Page 39 X, June 1956

"Automatic Spacing Stroke" means that start for the "total stroke", after spacing, comes automatically, and that the totalizer [in 300-class machines] is set in negative or positive position according to the value of the balance. Machines of the 40-series are so constructed that the segment stopping arms are obstructed during the spacing stroke, see Page 44 X, which means that an item can be set in the stop carriage without being added or subtracted when depressing the total and sub-total keys. That is why you can take a total directly after multiplication without clearing the key board.

When studying the function you had better remove the key board cover and key stem guide as well as the key stems and the key stop. Zero the machine from the positive side, i.e. so that no C-sign appears after the total-sign. Add some items, and de-



Note 1

Machines with and after the following Serial Numbers have a modified spring- and guiding system for the Sign Carrying Arm, riveted to the Carry Unit Cradle.

5341E - B70000
341EC - C85115
341E - B89628

The modification means that Positioning Catch K438, Spring Tension Accumulator K426, Spring 428, and Spring 429 are not used any more. The Carry Unit Cradle used after the modification is called K400N5. Carry-Over Unit 300K404H is replaced with K404N8. The Shift Spring Stretcher is modified too and then called 341-424E. It is connected to the Sign Carrying Arm by Spring 380-658. The modified parts are illustrated on Page 234 [341K404HE=K404N8], and the ancient construction on Page 230 of the Spare Parts List. The slot for the Sign Carrying Arm in the Key Board Cover was moved a little, and cover with this modification has number 251EN9.

If the new parts are put on a machine with lower number than the above, the Totalizer Support K909 must be checked for not jamming with the sign carrying arm.

1. The Rollers 3143 have been redesigned in order to provide safer mesh with the cams. The new rollers should be installed when overhauling machines. At the same time it will be necessary to change the Stretcher Links K3126V and H, as the stud has been altered to fit the new roller. Washer 761 is no longer used.

New numbers: 3143N2 Roller
K3126N3 Stretcher Link
K3126N4 Stretcher Link

The first machines of the 40-series were equipped with Print Hammer Frames that have riveted distance pins instead of pressed lugs. When installing K3126N3 and K3126N4 in such machines it will be necessary to file the extension "A" for free movement.

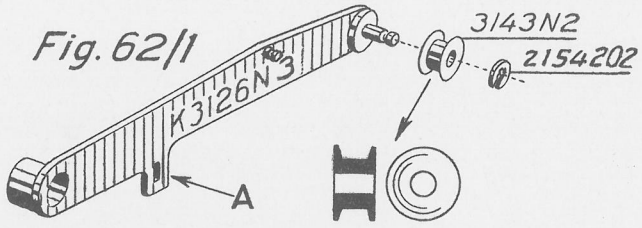


Fig. 62/1

2. It has proved that the Ribbon Guide Control Lug of the Print Hammer Frame K712 (different N-numbers) does not stand too much adjusting. Now, in case this lug breaks off you can remedy the machine by fixing the threaded pin 2139139 in the slot as shown in Fig. 62/2. The Tool R340 will help you to do this without removing anything but the cover and carriage of the machine. The pin should be so positioned that the ribbon guide cannot slip off. Also check after installing that the print hammers move freely in their slots and that the type bars are not prevented from printing. The Tool R340 also can be used when adjusting the outer nuts of the governor of the motor.

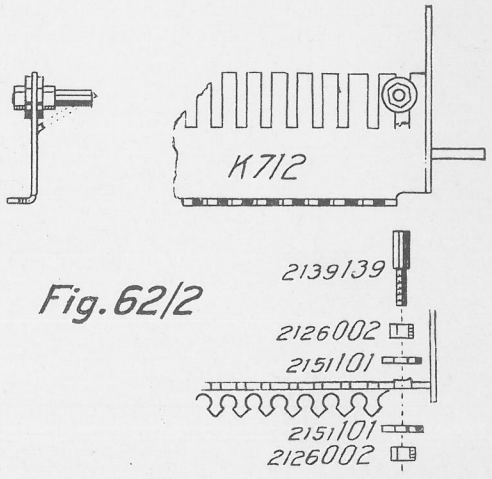


Fig. 62/2

This page ces page 62 X of 1.1.53

The driving mechanism on machines of the 40-Series consists of a set of cams which gives a smoother running than the link movement used on the 80-Series. The rollers of the L.H. and R.H. Drivers and of the Knife Stop run in slots of the cams which are fixed to the main shaft with pins.

An assembled Main Shaft has the basic number K130, for correct N-number see Key Book. Cams and Driving Segments are not delivered separately.

Removal

For taking the main shaft out of the machine, it will be necessary to remove key board, printing unit, tens mechanism, and centre shaft. Thus the cams can remain on the main shaft which is important - the cam D, Fig. 70, and corresponding part in the right side must never be detached from the left.

Installation

Place the main shaft in its bearing in the right hand side frame, and attach the driving segment outside the frame - the bearing to be greased in due order. Place the R.H. Driver K3103H so that the roller gets into the long slots of the cam, noting that those parts should be oiled, not greased. The left driver to be installed as per Fig. 70. Link 3101 to the left of the left cam and Roller 2294012 [3148] in the long slot of same. Lock with 2154203 [1013] ["B"].

Push the knife stop through the sectors on the centre shaft and place it as in the 80-Series. Oil the two Rollers 2294016 [3146].

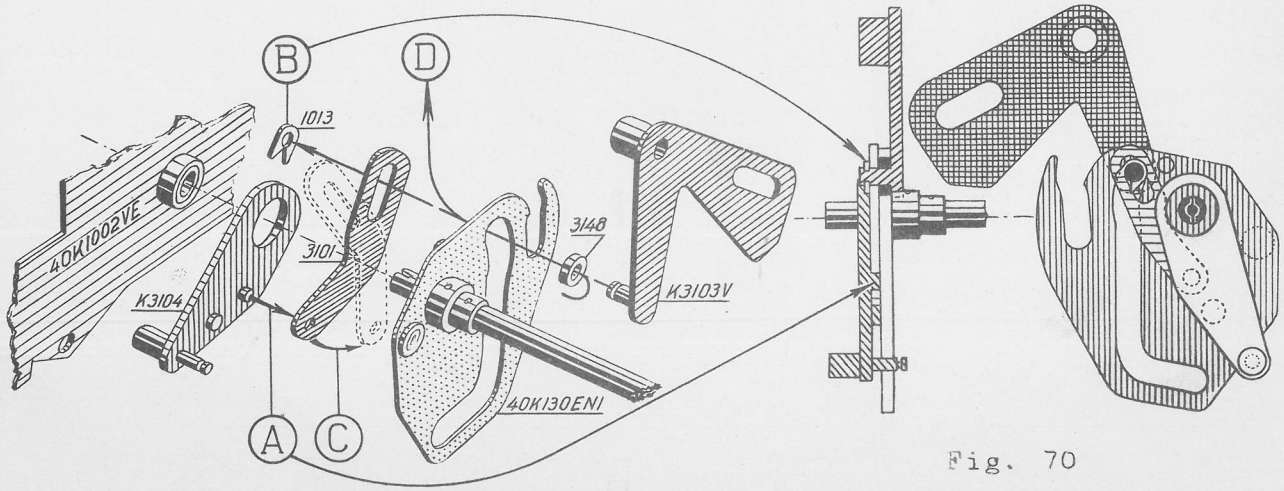


Fig. 70

and put them on their pivots of the knife stop. The left one to be locked by one 1013, the right one kept in place by the side frame.

Now set the assembled centre shaft in the right hand side frame, the operating pins projecting out through the apertures. Installation is facilitated by inserting a timing rod into the fore holes of the frames, see Page 238 of the Spare Parts List. Put the sign sector in position, i.e. so that the angle-bent arm rests in the slot of the side frame and the intermediate arm between the frame and the cam of the centre shaft. Push the Knife Stop Fulcrum Rod 40-632 through the L.H. Driver K3103V, the left and right arms of the knife stop, and the R.H. Driver K3103H. The Restoring Bridge 40K3601 to be placed on the rear links of the sectors, the rollers facing upwards. These rollers then should fit in the slots of the drivers. Attach the Spacing Shaft 40-1031 to the right hand side frame with Nut C1194. Insert the Knife stop fulcrum rod through the same side frame, and see that the rocker arm of 40K629 rests on the fore of the rod as shown in Fig. 71.

Put two Springs 3140F on the spacing shaft, their backs towards the side frames, and Guide 3112 between them.

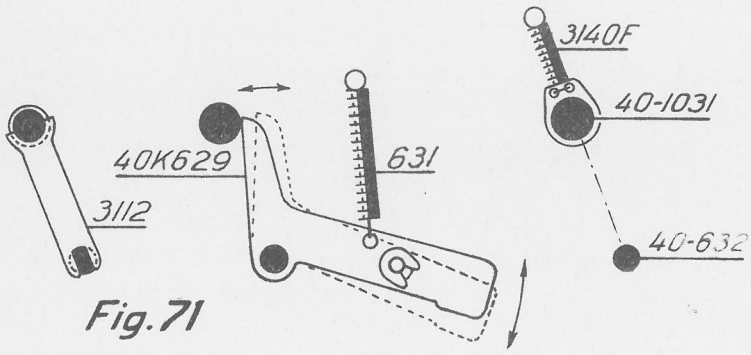


Fig. 71

Oil all rollers and bearings except those of the main shaft and centre shaft which should be greased.

The loose Driver K3104 to be placed on the main shaft bearing bushing in the left side frame, the larger stud towards the frame, see Fig. 70. Attach the left hand side frame to the base plate and fix the spacing shaft. Place the machine vertically and put the Link 3101 on the upper stud of the Driver K3104 [see Fig. 70]. The lower stud is for the Totalizer Shift Slide Driver 926 [different numbers in different models. See also Page 234 of the Spare Parts List].

Install the Sector Stop 604, fixing it with the spring anchors riveted to the side frames. Then attach two Springs 631 between these spring anchors and the arms of the knife stop. Place the left hand driving segment on the main shaft and fix it with Screw 40-113.

Insert a 5 mm rod through the side frames, sector links, and restoring bridge [40K3601] and see that the sectors do not bind anywhere. Also move the shaft seeing that all rollers rotate. After this control the Rebound Check Segment should be put in place - see under special headline.

1. Machines delivered after February 1950 are equipped with part 3156. There is a special stud on the left hand driving cam of the main shaft for the part, and the shaft has then number K130N9.

2. Spring 300-7926 was used in the Sector 40K600½EN1 for some time. But a shorter spring, number 3385, proved to be better for the purpose and was introduced in March 1951.

3. On machines with serial numbers lower than; 341E-82899, 345E-83450, 42E-83420, 41E-82534, and 40E-83015 Rollers 3147 and 3148 were made of a material not fit for the hardening-process required.

Rollers for replacement will be delivered upon demand, free of charge. They can be exchanged without dismounting the machine.

4. Spring 1118 in Driver K3104 has been replaced by Spring 3163 to provide safer function at the end of the stroke. The spring is fixed with Spring Clip 7914N1. It can be fitted to all machines equipped with part 3156.

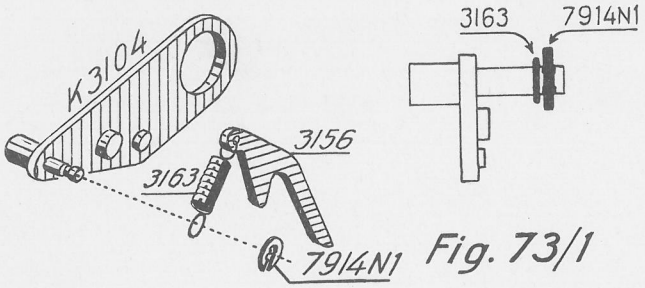


Fig. 73/1

The original non add key had the slot A [the upper one of the figures] made for a 5 mm stud. But it proved out that the key could then come in the way of the starting lever, and, therefore, it was modified to the shape shown at B, the number simultaneously being changed to 40K--271EN1. This modification is in mod. 40E on and from machine no. 83304, 41E - 82542, 42E - 83465, 341E - 83565, and 345E - 83452.

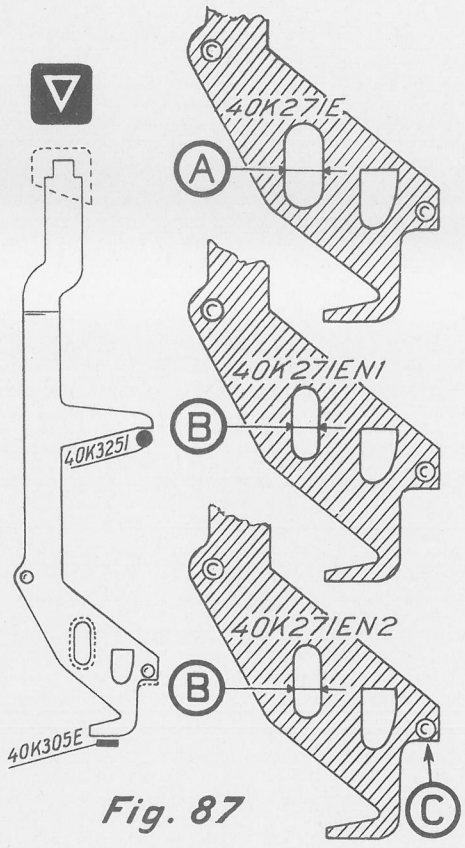


Fig. 87

The key numbered 40K271EN2 differs from the N1-key only through the cut at C. This cut, made in order that the stud of Starting Cam 40K3300 should have free passage, can be there only if the machine is equipped with total- and sub-total keys as per Fig. 91/2, i.e. keys with the long stem.

The N2-key is on the machines as follows: Mod. 40E on and from machine number 83649, 41E - 82556, 42E - 83479, 341E - 83455, and 345E - 83713.

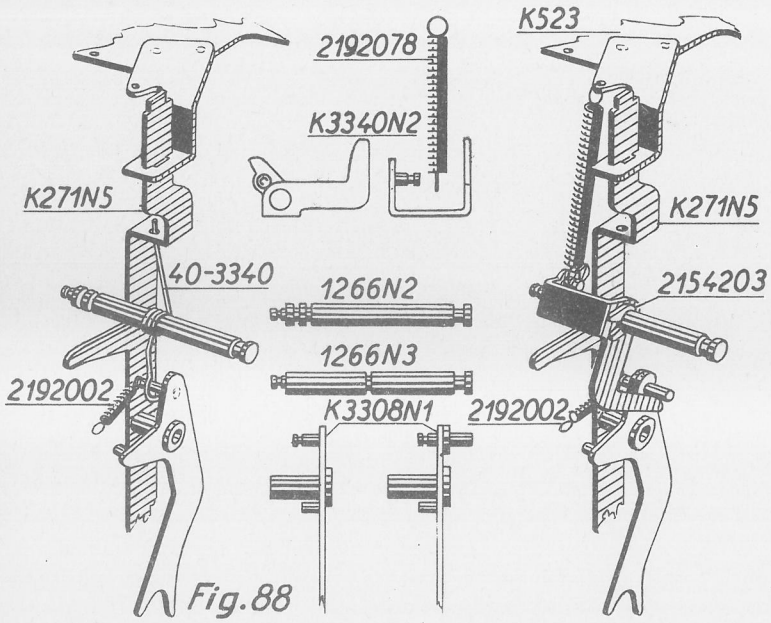


Fig.88

Twist Spring 40-3340 required too much adjustments, and has been superseded by the construction shown in Fig. 88. It consists of a Lifting Arm Retainer 40K3340, kept in position on a new Shaft 40-1266 by Spring Clip 1013, and a Spring 300-9300. The parts can be used on older machines if Lifting Arm 40K3308 is exchanged for a new one with a double pin.

The modification appears on machines after the following Serial Numbers:

40E - 86678	41E - 86259
42E - 87307	341E - 87145
345E - 85797	341EC- 85028

Fig. 91/1 shows the first type of total and sub total keys that was used on the 40 series. However, in order to improve the guiding of the keys they were modified to the shape shown in Fig. 91/2. New style keys can replace the old ones if Spring 931 is exchanged for 8640 at the same time.

To minimize the lateral play of the sub total key in machines where there is no spring clip on the total key bridge shaft, we have introduced a thin washer to be placed between the sub total key and the Start Balance Blocker 40-3302.

The washer is available in three different thicknesses, namely .10, .15, and .20 mm, and it appears in machines with the following serial numbers:

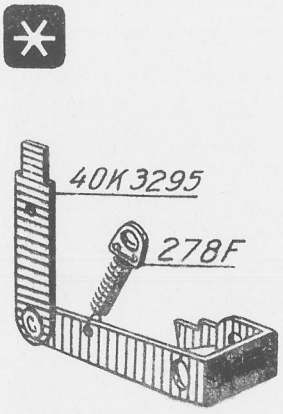
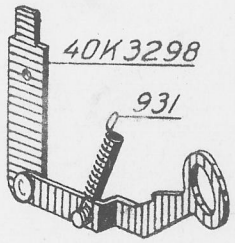


Fig. 91/1



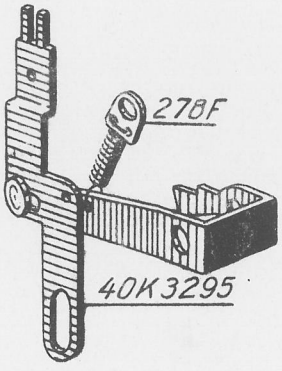
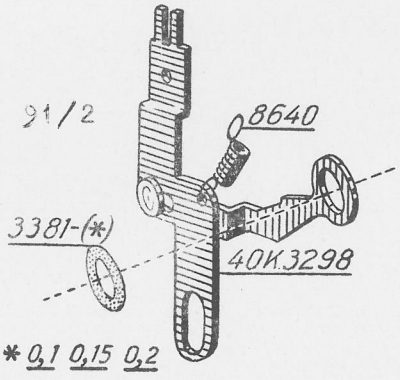


Fig. 91/2



Mod. 40E 83650-84758, 41E 82557-82598, 42E 83480-84552, and 341E 83456-85259.

Machines with numbers above those mentioned thus have a Spring Clip 3294 [Fig. 92] in the groove "B", limiting the lateral play of the parts. What caused this modification was the fact that the Start Balance Blocker 40-3302 could come at the side of the stop lug of the Start Balance 40K4210 thus failing to stop it. See Fig. 33.

In machines with this spring clip Sub-Total Key K3298N1 is carried by its shaft directly without bushing, which means that the hole "A" is smaller than before, see Fig. 91/1 and 91/2. The bearing of 40K3300N1 has been shortened, as it shall only carry the start balance blocker.

It will be seen from the above that parts with N-affix cannot substitute old style parts separately, which must be considered when ordering spare parts.

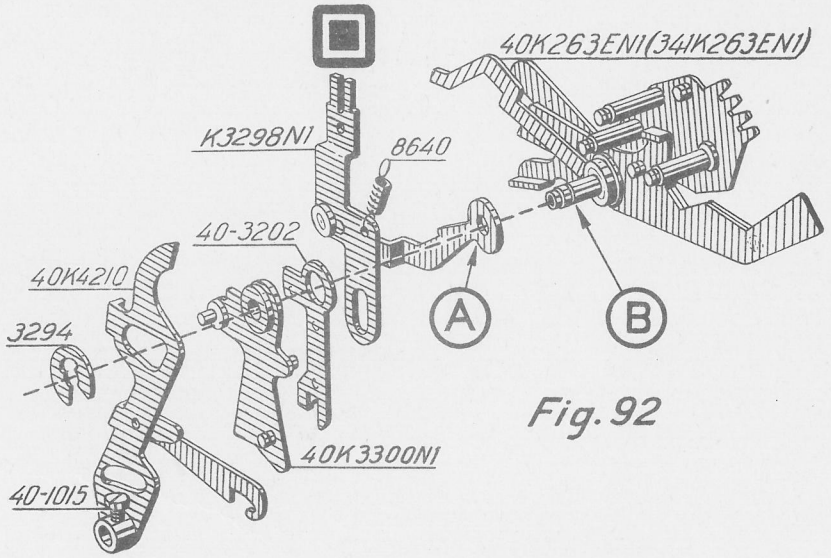


Fig. 92

After the total key has been slotted as per Fig. 91/2 it is no use having it pawled in down position. Therefore, the following alteration has been made.

Key Stem Stop 40K3266 is removed. Spring 8640 between this stop and the sub-total key (see Fig. 91 and 92) is replaced by one between the key and the upper key board shaft. The locking groove of the key board shaft is moved to eliminate play when the key stop is removed. Part 40K3312 has operating stud for the sub-total key only.

The following notes should be made in the Spare Parts List:

40-252ÖE	Pag. 218, 222, 234	altered to 40-252ÖEN1	Upper Key Board Shaft
8640 earlier 931	Page 91X, 92X (Service Manual)	replaced by 40-3349F	Spring
40K3266	Pag. 218	removed	Key Stem Stop
40K3312	Pag. 218	replaced by 40K3312N1	Lifting Arm Dog Actuator.

Subtraction Starting Lever K3287

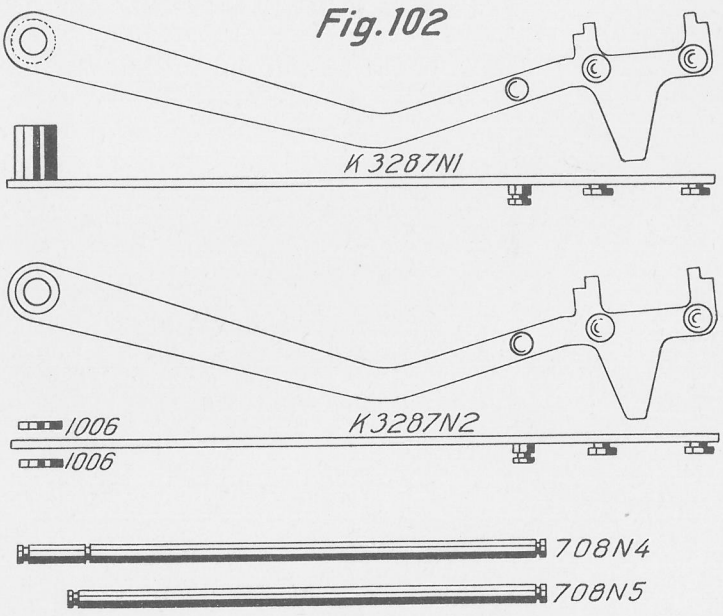
The guiding of the subtraction lever has been improved, so that the bearing bushing is now unnecessary. The shaft is shortened by the corresponding measure and provided with Shims 1006 as per Fig. 102.

New numbers:

Subtraction Starting Lever	K3287N2
Shaft	708N5
Shims	1006

Only the modified lever is delivered as spare part. Shaft will be delivered according to the number given on the spare parts order form.

When the subtraction starting lever is restored there is an audible knock in the machine. This can be avoided by putting a mipolam-bushing No. 20235 on the Release Link K3259 where it is hit by the starting lever. This modification will be found in recently manufactured machines.



THE REPEAT KEY

In order to facilitate assembling the starting device on the left side of the machine is now mounted on a shaft 40-267N1 which can be drawn out through the left side of the key board frame. The following modifications then have been made.

A bearing hole has been bored in the left side of the key board which has then the N18-affix after part number. Shaft 40-267 has been provided with a groove for fixing and is then numbered 40-267N1. The bearing of Repeat Lever 40K3281 has been shortened to give place for a locking knee. Number changed to 40K3281N1.

A new shaft, 40-279¼N1, is introduced. On this is pivoted Starting Bridge Actuator 40K3256N1, modified into the shape shown in Fig. 113, and Total Locking Lever 40K279EN1, which is provided with a bearing tube instead of the double bent bracket.

Shafts 40-267N1 and 40-279¼N1 [number wrong on Fig. 113] are locked laterally by Locking Knee 40-267½. On this part there is a lug which should prevent the repeat stem from jumping up and getting blocked on the key board. However, on some machines there is locking knee without this lug. Such parts should be exchanged for new ones.

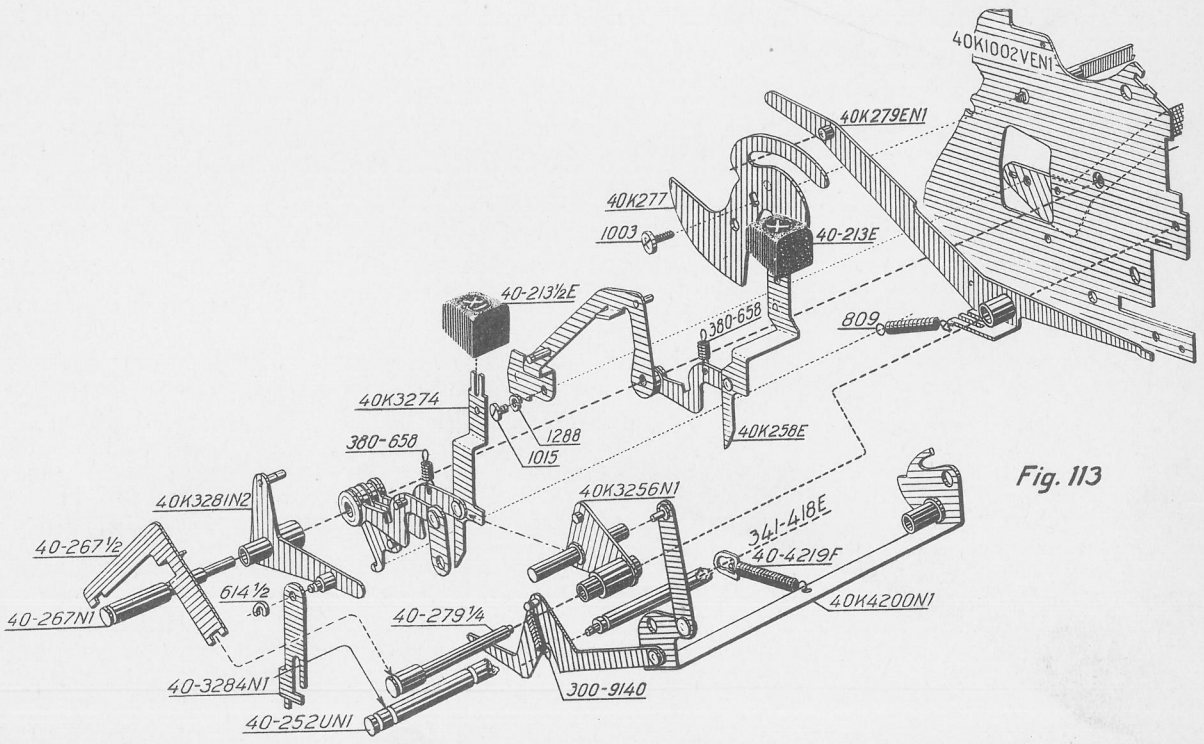


Fig. 113

THE REPEAT KEY

As a special locating shaft is to be used on future machines two parts have already been modified in accordance herewith, namely the repeat lever and the repeat stem. On the modified repeat lever, 40K3281N2, the stud for operating the repeat stem has been moved towards the bearing. The new repeat stem 40-3284N1 has a slot for guiding on the lower key board shaft. This shaft also has been provided with a groove for this purpose and has then number 40-252UN1.

1. New Carbon Brushes for the governor (motors with one way of rotation only)

New machines will be equipped with governors that are modified as per point 3 underneath. That is why the carbon brushes delivered from now on will be of the type shown in the fig. 116/1. They are stamped MK2 on one of the flat surfaces and marked with a green spot at the end. The part number is 90122 N1. New brushes are put into the old style holders. (Similarly shaped brushes for 6000 and 7000 machines have got the part number 91042N1).

Fig 116/1

2. New Brush Holder Fulcrum

In order to avoid excessive wearing of the brush holder bearings we are now using Slotted Pins 2113003 as fulcrum instead of the hitherto used tubular pins. Worn brush holder bearings can break the current and stop the machine. The brush holders are numbered as follows:

Outer holder 91117
Center holder 91118
Inner holder 91116.

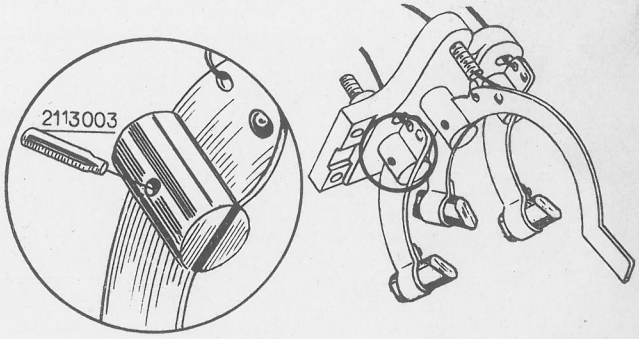


Fig 116/2

3. Governor 90206N6

Some Customers are complaining of the governors short-circuiting between the contact rings. Therefore, these rings are now made more narrow so as to get more insulating material between them. Governors thus modified get the number 90206N6. Note that also the carbon brushes have to be exchanged (see point 1) when replacing the old style governor 90206N4 by the new one 90206N6.

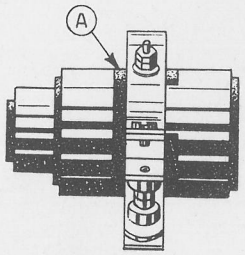


Fig 116/3

Machines with Serial Number below 500000

The machine should make 140 revolutions per minute when adding and 120 when taking totals. Check after zeroing the machine by letting it run for one minute with the key 1 depressed, MULTIPLIER LEVER IN STEPOVER POSITION. Speed at total is checked in the same way, only must then the total carbon brush be kept off the speed governor all the time. Changing the RPM is done by increasing or decreasing the tension of the governor contact springs using the two pair of nuts for adjusting.

Machines with Serial Number higher than 500000

Machines with a serial number higher than 500000 are designed to stand an increased speed, which is 170 in adding and 110 for total, MULTIPLIER LEVER IN STEPOVER POSITION. Such machines have on the right side a cam and spring lever assembly that balances its movement, then the stop carriage rail has elastic bearings. To check and adjust proceed as outlined in previous paragraph.

There should be a distance of 8 - 9 mm between the movable Brush Holder and the stud of the governor link [8] in rest position. The entire face of the Total Carbon Brush [7] must contact the governor.

This page r[illegible]es page 120 X, November 1955

LUBRICATION

We have recommended the following Shell products to be used when lubricating Addo machines: Grease: Alvania 1 or Aero 4, Oil: Tellus 33 or Turbo 29. These qualitites may be difficult to get in certain areas, and that is why our laboratory has tested some other lubricants and those listed below have been approved for use in our makes.

Grease

Alvania 1	Shell
Aero 4	Shell
Aviation Low temp.	Esso
Low temp.	Caltex

Dash-Pot Oil

Tellus 33	Shell
Teresso 52	Esso
Regal PC	Caltex

Oil for general use

Turbo 29	Shell
Teresso 47	Esso
Regal B	Caltex

Paper feed unsatisfactory

If Spring 3136 is not properly installed [on the carriage outside] it may enter between the pressure plate and the carriage frame. Thus it prevents the feed rolls from co-operating with the platen, and the paper feed becomes unsatisfactory. Remedy by bending the fixing-loop of the spring. Some machines have left the factory without this adjustment having been made.

Wrong number in beginning of an item set on the key board on machines with short depression key board

When manipulating the keys in a certain way it is possible to get the wrong number in the beginning of an item set on the key board. This can possibly happen, if a numerical key is depressed when the stop carriage is returning and stopping against the buffer. Any stop-pin can then jump up and cause the indicated misfunction.

To avoid this trouble we bevelled the stop-surface of the buffer, so that the stop carriage does not vibrate at the end of its restoring movement. The recoil was made smoother by exchanging Spring 40-3344 for E12195. The latter spring is delivered free of charge as replacement for 40-3344. A roof also has been provided on the buffer holder, so as to fix the position of the rubber piece.

If wrong number should enter in spite of adjustment being made as per the above instructions you are advised to install Spring 7680½ in the Escapement Bracket 40K230E [=K230N6], and in extraordinarity difficult cases

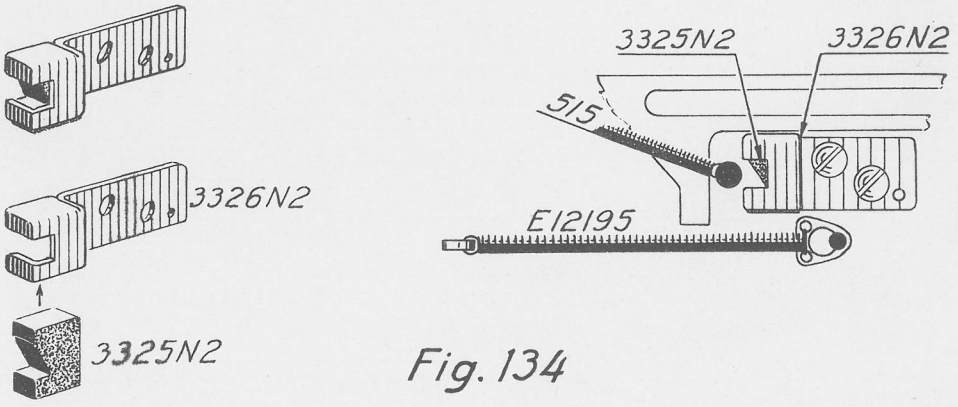


Fig. 134

to install Lock 40K294 of newest fashion [=K294N3].

In accordance with wishes from several customers we have made a note-plate 4053 to be attached to the middle bracket of the carriage with two Screws 3151. Before drilling holes [Ø2.1] and cutting threads [M2.6] for these screws you had better dismount the platen and carriage.

Total seems to be wrong.

The note-plate is recommended in case you want to minimize the risk of the operator hindering the type bars in "total" by drawing the control slip down over the type bars. This plate is delivered against special order only.

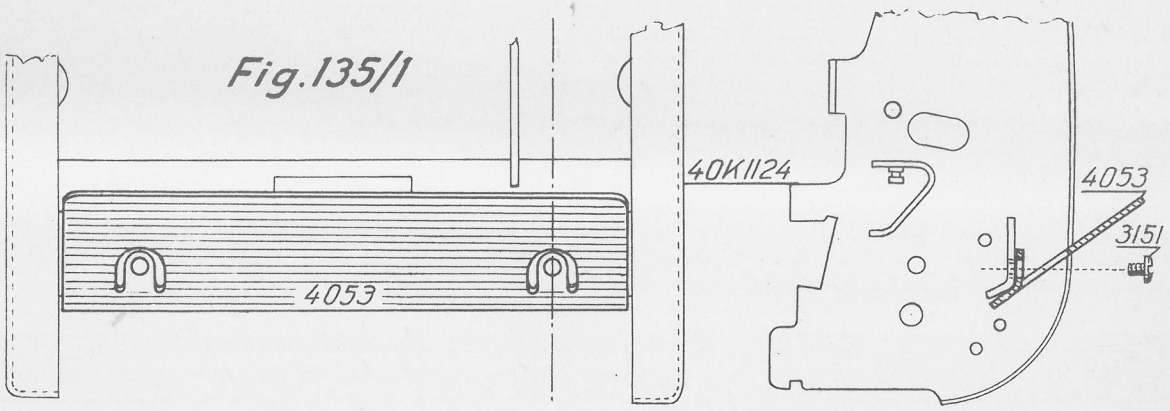


Fig.135/1

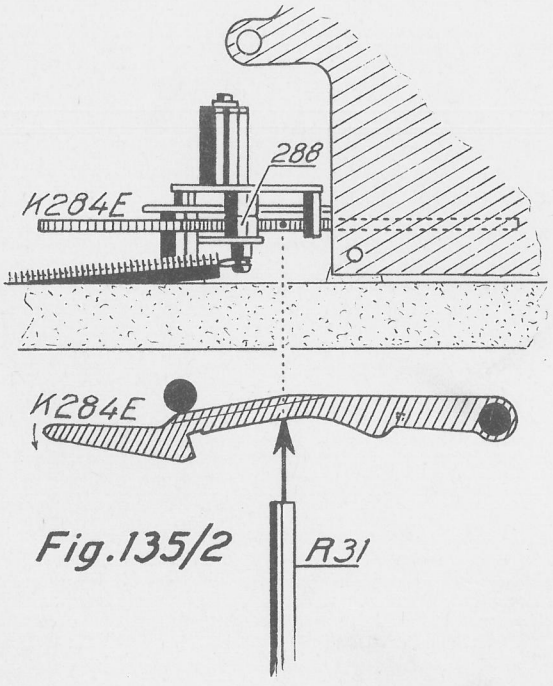


Fig.135/2

We have described earlier that the Return Step Hook K283E must not slip off Roller 288 before the stop carriage has been restored with an over-travel of 1.5 - 2 mm.

This is very important specially on machines equipped with automatic step-over mechanism. In case of a bad adjustment the roller on part K261N6 can actuate the step-over mechanism during total and sub-total. Then the stop carriage makes one step, and the first sector to the right will be stopped by the 0-pin.

Stop Carriage steps on spacing stroke.

Adjust the return step hook by giving it an easy knock after the machine has been pulled through half a stroke. See Fig.

Check that the stop carriage is properly restored.

Also check that Step Feeding Link K261N6 slides easily on the stud of Step Lever K282N6.

Continued on next page.

This Pag laces Page 135 X of 15.12.52

Machine jamming on Total

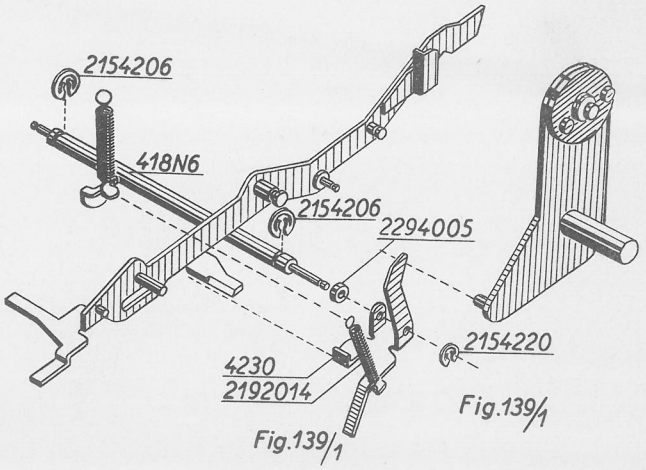


Fig.139/1

Depressing Total Key at the right (wrong) moment after multiplying with step-over can under circumstances obstruct certain machines. The cause of this is the Blocking Bridge 247N2 interfering with the stop carriage teeth before the stop carriage has reached its right position. However, this is avoided positively if Start Detainer 4230 is installed on Shaft 418N6 (on machines with Credit Balance: 418N7). The detainer keeps part 305 from starting, until released by a stud of the main shaft. When installing the new detaining arrangement as per Fig. 139/1 the following parts will be required:

Shaft 418N6 (418N7 for Credit Balance machines)	
Start Detainer	4230
Spring	2192014
Spring Clips	2154220 (instead of 2154201)
Spring Clips (two)	2154206 (instead of 2154204)

Misprinting (Series 40E with Step-O-Matic feature)

If the machine prints a lower figure than set on the key board when multiplying with step-o-matic lever in off position, the Starting Lever K1209 is probably hitting the Starting Ratchet 1212 during operation. The machine is thus disengaged from the motor (and speed governor) for a short period and runs ahead of the motor at a temporarily increased speed.

Do the following check: Remove the Balance Spring 2192993 if there is one, disconnect the power, set the step-o-matic lever in off position, depress the multiplication key, actuate the machine by hand until the starting ratchet engages in the starting ratchet wheel, mark the position of the ratchet on the wheel, and let the machine run under power about twenty revolutions in multiplication. Then disconnect the power again but KEEP THE REPEAT KEY DEPRESSED, and observe if the ratchet wheel has retained its position in relation to the ratchet. If it has not, the Starting Bridge K4200 must be adjusted for an earlier start, and this is done by shortening the lug (at X, Fig. 139/2) of the restoring lever, just a trifle. Then check again as described above. Be careful not to shorten the lug more than is absolutely necessary to prevent the starting ratchet from disengaging during operation. After a perfect adjustment as per above, the Balance Spring 2192993 is no longer necessary. THIS ADJUSTMENT SHOULD NOT BE DONE UNLESS THE MACHINE IS EQUIPPED WITH START DETAINER 4230 AS PER PREVIOUS PARAGRAPH.

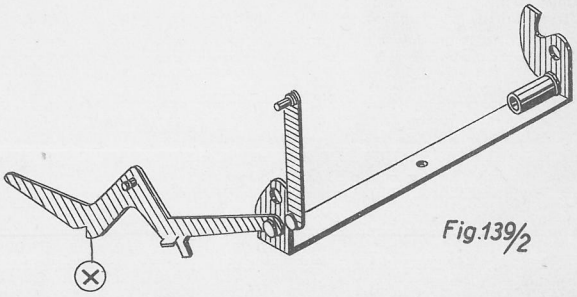


Fig.139/2

This page replaces Page 139X of January, 1955

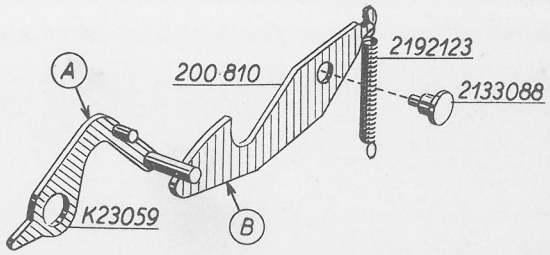
Counter-Balance Spring 2193807

In machines where the spring for part K1209 is so positioned as shown in Fig. 38/3 it is not advisable to install the double balance spring. The proper spring to be used on such machines is one with Part Number 2193807. This spring should be installed between the stud of the right hand driving segment and the short rod of the bearing plate, close to the bearing of the Starting Ratchet Wheel.

The purpose of the spring is to aid in counterbalancing the movement of the machine in order to prevent the wrong figures to be printed. The modification described on Page 39 X does not cover Total and Sub-Total, so you may have to use a counterbalance spring in spite of what is said in the last sentence on Page 39 X.

1. Totalizer Coupling Adjustment.

We have had a few cases where the machine has blocked up because the lower outer dog of the Totalizer Coupling has come above the stud of part K23059 in Sub-Total out of the second Totalizer. This dog (B) should go under the stud, and to insure correct function at this point, it may be necessary to form the stud rearwards, in over the dog. When doing so, you are recommended to support Part K23059 by inserting a screwdriver at "A" between the part and the side frame.

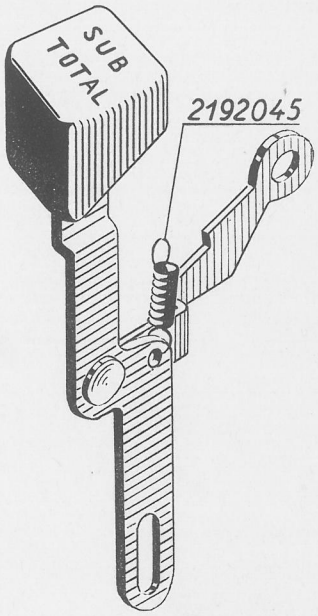


If a machine blocks up as described above, the Totalizer Coupling is likely to get bent. The most safe repair in such a case is to install a new coupling. However, you may not have this part in stock, and then you will have to dress the bent one very carefully. If so, note that the outer contours of the two members should cover each other closely. It is advisable to lengthen the dog a little for better engagement on the stud at the same time. You can also remove the dog entirely and use a new and longer dog. Such dogs, and rivets are available as spare parts under the Parts Numbers indicated in fig.

1. New Sub-Total Key Spring.

A stronger spring is now used to keep the Sub-Total Key in rest, or inactive, position. We made this modification, because an operator could, through hitting the Total Key violently, engage the Sub-Total Mechanism, and make the machine behave as if the Sub-Total Key had been depressed.

The stronger spring has Spare Part Number 2192045, and it has been installed here at the factory on all 200-class machines bearing a Serial Number higher than 525028. If machines with a lower number give you trouble in this respect, reject the formerly recommended Spring 2192032 and install 2192045 instead.



2. Underaddition in 2nd Totalizer.

If a Total from the 1st Totalizer fails to enter the 2nd Totalizer we get underaddition as a result. This has happened in a few cases, and in these cases the Total was always taken directly after a Sub-Total.

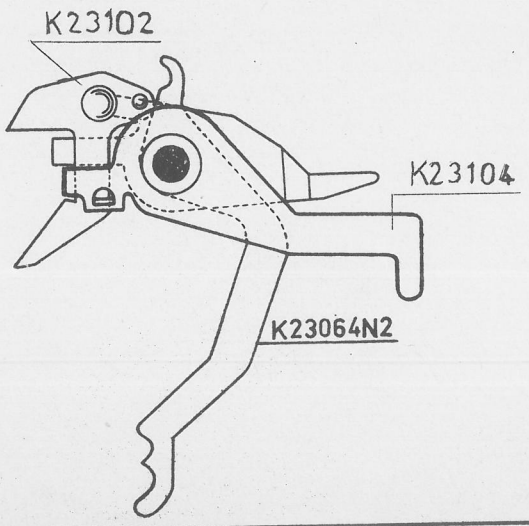
The tally roll then shows the following picture:

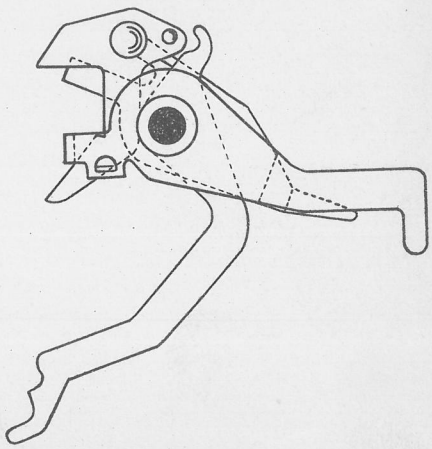
```
                    * ∴
                    * II
          6 6 6.0 0
          6 6 6.0 0
      1.3 3 2.0 0 *
                    * II
          6 6 6.0 0
          6 6 6.0 0
      1.3 3 2.0 0 * ∴
      1.3 3 2.0 0 * II
```

Cause of the trouble: This kind of trouble may be caused by a bind in Part K23104. If there is a bind, namely, Part K23104 may remain in set position, i. e. the position it has during a Sub-Total stroke. This position is shown in the right hand figure below. Note that Part K23102 will not actuate the latch when rotating into active position for Total.

The left hand fig. shows correct initial position of both parts. When K23102 rotates into Total position it takes K23104 with it, which it should.

A bind like this may appear in machines manufactured before October 1956, because in such machines there is nothing the hold the shaft, on which the two parts in question are fulcrumed, in position sideways. Consequently, the shaft can move sideways and jam the parts against the side frame.





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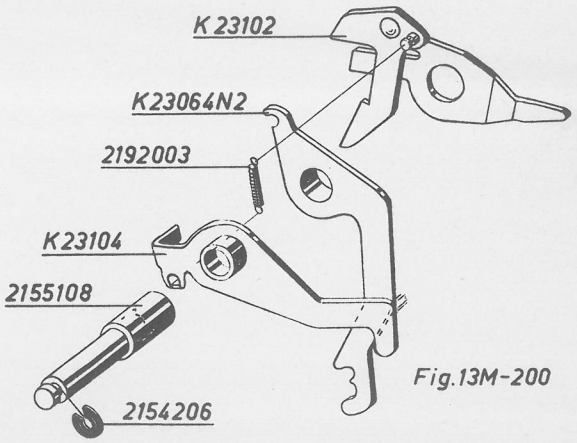

Fig.13M-200

Repair: In machines manufactured after September 1956 the parts K23064N2, K23104 and K23102 are fulcrumed on a Bushing 2155108 which guarantees free movement. The shaft then can jam the bushing, but never the parts on the bushing. The repair will be to install the modifed parts and the bushing. (The bushing has an outer diameter of 6 mm, and the only modification made to the K23104 and K23064N2 is an enlarging of the bearing holes).

Additional safety is obtained by using Spring 2192003 instead of 2192011 as shown in fig.

Parts to be ordered for this modification:

K23064N2
K23104
2155108
2192003.

Total and Sub Total in 2nd Totalizer Modifications.

1. Modified NA Key Interlock Slide to prevent jamming the machine by forcing down "II-knob" during Total stroke.

Nature of Trouble:

To understand the cause of the trouble, remove covers and actuate the machine by hand after depressing the Total Key. At the end of the restoring stroke, the Total Actuator comes to its active (raised) position. In this situation the lug (A) of the Support Plate is below the stud (B) of the Interlock Slide to secure it in its upper position. However, if you press on the "II-key" hard enough you can force the stud (B) past the lug (A) sideways. This applies, of course, to machines that have not been modified.

If the "II-key" is actuated in this manner, the outer totalizer coupling may be set in an intermediate position in which it contacts both center shaft studs at the same time. Thus, the coupling cannot move at all, but blocks the machine and gets distorted.

Modification

Install the new K20218 which has a longer stud (B). If the Totalizer Coupling is dirtorted, dress it carefully, or install a new one.

The modification is in production since Serial Number 527364.

Old style interlock slides have been scrapped.

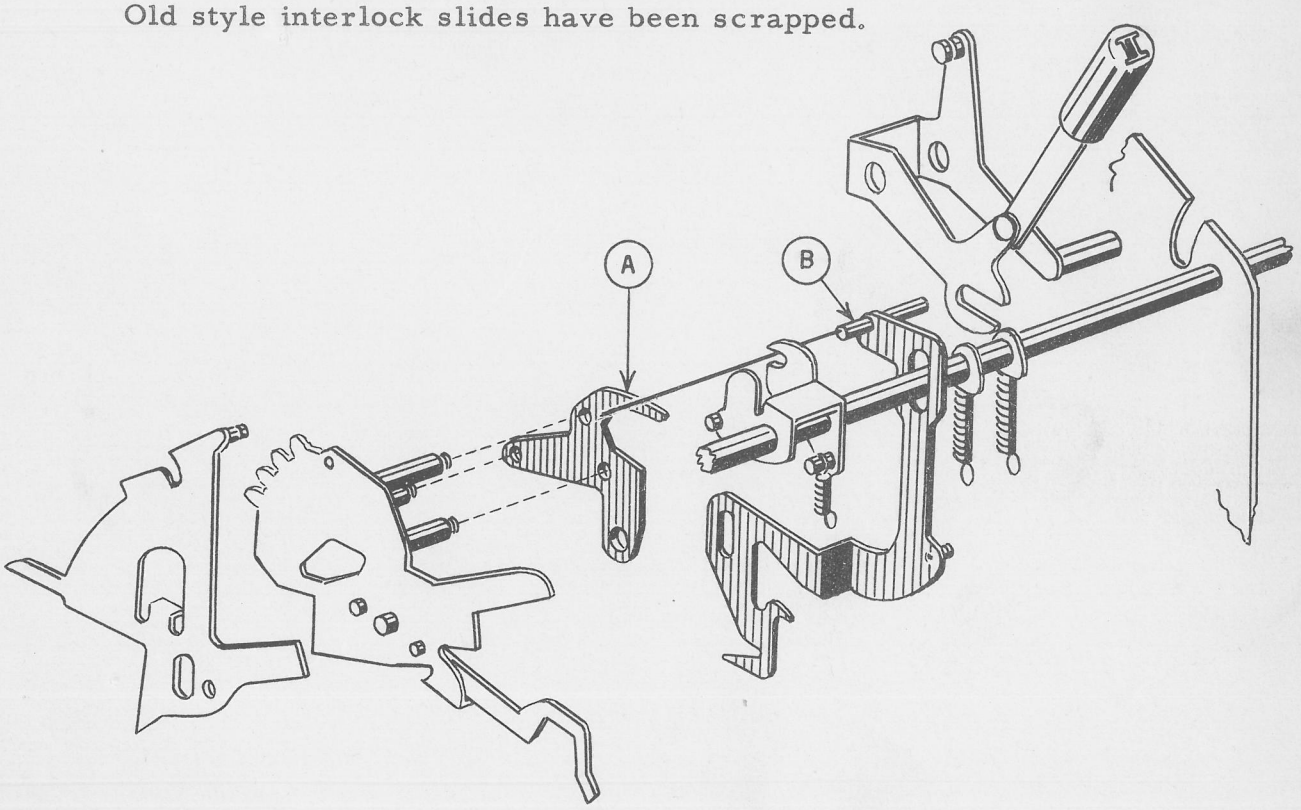

Fig. 211

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